



New England Bioassay

A Division of GZA



CHRONIC AQUATIC TOXICITY TEST REPORT

**Pine Brook Country Club
Weston, Massachusetts**

Ceriodaphnia dubia Survival and Reproduction Test – EPA 1002.0

Pimephales promelas Larval Survival and Growth Test – EPA 1000.0

EPA 821-R-02-013, “Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms”, Fourth Edition

Test Start Date: 7/18/16

Test Period: July 2016

Report Prepared by:

New England Bioassay
A division of GZA GeoEnvironmental
77 Batson Drive
Manchester CT, 06042
NEB Project Number: 05.0752101.00

Report Date: August 17, 2016

Report Submitted to:

Pine Brook Country Club
42 Newton Street
Weston, MA 02493

Sample ID: Effluent

If you have any questions concerning these results, please contact the Lab Manager, Kim Wills, at (860) 858-3153 or kimberly.wills@gza.com.

GEOTECHNICAL
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NEW ENGLAND BIOASSAY, A DIVISION OF GZA EPA TEST SUMMARY SHEET

Facility Name: Pine Brook Country Club Test Start Date: 7/18/16
 NPDES Permit Number: MA0032212 Outfall Number: _____

<u>Test Type</u>	<u>Test Species</u>	<u>Sample Type</u>	<u>Sample Method</u>
<input type="checkbox"/> Acute	<input type="checkbox"/> Fathead Minnow	<input type="checkbox"/> Prechlorinated	<input type="checkbox"/> Grab
<input type="checkbox"/> Chronic	<input checked="" type="checkbox"/> Ceriodaphnia Dubia	<input type="checkbox"/> Dechlorinated	<input checked="" type="checkbox"/> Composite
<input checked="" type="checkbox"/> Modified (Chronic reporting LC50 values)	<input type="checkbox"/> Daphnia Pulex	<input checked="" type="checkbox"/> Unchlorinated	<input type="checkbox"/> Flow-thru
<input type="checkbox"/> 24-Hour Screening	<input type="checkbox"/> Mysid Shrimp	<input type="checkbox"/> Chlorinated	<input type="checkbox"/> Other
	<input type="checkbox"/> Sheepshead		
	<input type="checkbox"/> Menidia		
	<input type="checkbox"/> Sea Urchin	TRC conc. <u>0.005 mg/L</u>	
	<input type="checkbox"/> Selenastrum		
	<input type="checkbox"/> Other _____		

Dilution Water

Receiving water collected at a point immediately upstream of or away from the discharge;
 (Receiving water name and sampling location: Pine Brook -see COC)
 Alternate Surface Water of known quality and a hardness to generally reflect the characteristics
 of the receiving water; (Surface water name: _____)
 Synthetic water prepared using either Millipore Mill-Q or equivalent deionized water and
 reagent grade chemicals; or deionized water combined with mineral water;
 Artificial sea salts mixed with deionized water;
 Other _____

Effluent Sampling Date (s): 7/17-18/16 7/19-20/16 7/21-22/16

Effluent Concentrations Tested (in%): 0% 6.25% 12.5% 25% 50% 100%
 * (Permit Limit Concentration): 25% (C-NOEC)

Was effluent salinity adjusted? No If yes, to what value? N/A ppt

Reference Toxicant test date: 7/1/16 Reference Toxicant Test Acceptable: Yes No

Age and Age Range of Test Organisms < 24 hours Source of Organisms NEB Lab

TEST RESULTS & PERMIT LIMITS

Test Acceptability Criteria

A. Synthetic Water Control
 Mean Control Survival: 100% Mean Control Reproduction: 24.7 young/female

B. Receiving Water Control
 Mean Control Survival: 100% Mean Control Reproduction: 29.3 young/female

C. Lab Culture Control Yes No
 Mean Control Survival: N/A Mean Control Reproduction: N/A

D. Thiosulfate Control Yes No
 Mean Control Survival: N/A Mean Control Reproduction: N/A

Test Variability

Test PMSD (growth) N/A Upper and Lower PMSD bound N/A low in-bounds high
 Test PMSD (reprod.) 17.6% Upper and Lower PMSD bound 13-47% low in-bounds high

Permit Limits & Test Results

	<u>Limits</u>		<u>Results</u>
LC50	<u>>100%</u>	LC50	<u>>100%</u>
		Upper Value	<u>±∞</u>
		Lower Value	<u>100%</u>
		Data Analysis	
		Method Used	<u>Graphical</u>
A-NOEC	<u>N/A</u>	A-NOEC	<u>100%</u>
C-NOEC	<u>>25</u>	C-NOEC	<u>100%</u>
		LOEC	<u>>100%</u>
IC25	<u>N/A</u>	IC25	<u>>100%</u>
IC50	<u>N/A</u>	IC50	<u>>100%</u>

PMSD Comparison Discussion (Test Variability/Sensitivity)

Reproduction

- 1. PMSD exceeds upper bounds. Test results are highly variable and may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC).
- 1a. Test results indicate the discharge is not toxic at the PLC. Test is not sufficiently sensitive and must be repeated within 30 days of the initial test completion date using fresh samples.
- 1b. Test results indicate the discharge is toxic at the PLC. Test results are considered acceptable and the test does not have to be repeated.
- 2. The PMSD falls within the upper (47%) and lower (13%) bounds. Results are reportable.
- 3. PMSD falls below the lower bound test variability criterion. The test is very sensitive. The relative percent difference (RPD) between the control and each treatment was calculated and compared to the lower PMSD boundary
- 3a. The RPD values for each concentration fall below the lower bound. The differences observed in this test are considered statistically insignificant.
- 3b. The RPDs for the following concentrations are above the lower bound _____.
The results at these concentrations are considered statistically significantly lower than controls.

Concentration-Response Evaluation

The concentration-response relationship observed in this data set corresponds to the following item number in Chapter Four of "Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing (40 CFR Part 136)", EPA 821-B-00-004, July 2000:

Survival Reprod.

- 1. Ideal concentration-response relationship
- 2. All or nothing response
- 3. Stimulatory response at low concentrations and detrimental effects at higher concentrations
- 4. Stimulation at low concentrations but no significant effect at higher concentrations
- 5. Interrupted concentration-response: significant effects bracketed by non-significant effects
- 6. Interrupted concentration-response: non-significant effects bracketed by significant effects
- 7. Significant effects only at highest concentration
- 8. Significant effects at all test concentrations but flat concentration-response curve
- 9. Significant effects at all test concentrations with a sloped concentration-response curve
- 10. Inverse concentration-response relationship

The concentration-response relationship was reviewed according to the above guidance document and the following determination was made:

Survival Reprod.

- 1. Results are reliable and reportable.
- 2. Results are anomalous. An explanation is provided in the body of the report.
- 3. Results are inconclusive. A retest with fresh samples is required. An explanation is provided in the body of the report.

NEW ENGLAND BIOASSAY, A DIVISION OF GZA EPA TEST SUMMARY SHEET

Facility Name: Pine Brook Country Club Test Start Date: 7/18/16
 NPDES Permit Number: MA0032212 Outfall Number: _____

<u>Test Type</u>	<u>Test Species</u>	<u>Sample Type</u>	<u>Sample Method</u>
<input type="checkbox"/> Acute	<input checked="" type="checkbox"/> Fathead Minnow	<input type="checkbox"/> Prechlorinated	<input type="checkbox"/> Grab
<input type="checkbox"/> Chronic	<input type="checkbox"/> Ceriodaphnia Dubia	<input type="checkbox"/> Dechlorinated	<input checked="" type="checkbox"/> Composite
<input checked="" type="checkbox"/> Modified	<input type="checkbox"/> Daphnia Pulex	<input checked="" type="checkbox"/> Unchlorinated	<input type="checkbox"/> Flow-thru
(Chronic reporting LC50 values)	<input type="checkbox"/> Mysis Shrimp	<input type="checkbox"/> Chlorinated	<input type="checkbox"/> Other
<input type="checkbox"/> 24-Hour Screening	<input type="checkbox"/> Sheepshead		
	<input type="checkbox"/> Menidia		
	<input type="checkbox"/> Sea Urchin	TRC conc. <u>0.005 mg/L</u>	
	<input type="checkbox"/> Selenastrum		
	<input type="checkbox"/> Other _____		

Dilution Water

Receiving water collected at a point immediately upstream of or away from the discharge;
 (Receiving water name and sampling location: Pine Brook -see COC)
 Alternate Surface Water of known quality and a hardness to generally reflect the characteristics
 of the receiving water; (Surface water name: _____)
 Synthetic water prepared using either Millipore Mill-Q or equivalent deionized water and
 reagent grade chemicals; or deionized water combined with mineral water;
 artificial sea salts mixed with deionized water;
 Other _____

Effluent Sampling Date (s): 7/17-18/16 7/19-20/16 7/21-22/16

Effluent Concentrations Tested (in%): 0% 6.25% 12.5% 25% 50% 100%
 * (Permit Limit Concentration): 25% (C-NOEC)

Was effluent salinity adjusted? No If yes, to what value? N/A ppt

Reference Toxicant test date: 7/1/16 Reference Toxicant Test Acceptable: Yes No

Age and Age Range of Test Organisms < 24 hours Source of Organisms NEB Lab

TEST RESULTS & PERMIT LIMITS

Test Acceptability Criteria

A. Synthetic Water Control
 Mean Control Survival: 100% Mean Control Weight: 0.613 mg

B. Receiving Water Control
 Mean Control Survival: 75% Mean Control Weight: 0.568 mg

C. Lab Culture Control Yes No
 Mean Control Survival: N/A Mean Control Weight: N/A

D. Thiosulfate Control Yes No
 Mean Control Survival: N/A Mean Control Weight: N/A

Test Variability

Test PMSD (growth) 11.9% Upper and Lower PMSD bound 12-30% low in-bounds high
 Test PMSD (reprod.) N/A Upper and Lower PMSD bound N/A low in-bounds high

Permit Limits & Test Results

	<u>Limits</u>		<u>Results</u>
LC50	<u>>100%</u>	LC50	<u>>100%</u>
		Upper Value	<u>±∞</u>
		Lower Value	<u>100%</u>
		Data Analysis	
		Method Used	<u>Graphical</u>
A-NOEC	<u>N/A</u>	A-NOEC	<u>100%</u>
C-NOEC	<u>≥25</u>	C-NOEC	<u>100%</u>
		LOEC	<u>>100%</u>
IC25	<u>N/A</u>	IC25	<u>>100%</u>
IC50	<u>N/A</u>	IC50	<u>>100%</u>

PMSD Comparison Discussion (Test Variability/Sensitivity)

Growth

- 1. PMSD exceeds upper bounds. Test results are highly variable and may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC).
- 1a. Test results indicate the discharge is not toxic at the PLC. Test is not sufficiently sensitive and must be repeated within 30 days of the initial test completion date using fresh samples.
- 1b. Test results indicate the discharge is toxic at the PLC. Test results are considered acceptable and the test does not have to be repeated.
- 2. The PMSD falls within the upper (30%) and lower (12%) bounds. Results are reportable.
- 3. PMSD falls below the lower bound test variability criterion. The test is very sensitive. The relative percent difference (RPD) between the control and each treatment was calculated and compared to the lower PMSD boundary
- 3a. The RPD values for each concentration fall below the lower bound. The differences observed in this test are considered statistically insignificant.
- 3b. The RPDs for the following concentrations are above the lower bound _____.
The results at these concentrations are considered statistically significantly lower than controls.

Concentration-Response Evaluation

The concentration-response relationship observed in this data set corresponds to the following item number in Chapter Four of "Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing (40 CFR Part 136)", EPA 821-B-00-004, July 2000:

Survival Growth

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 1. Ideal concentration-response relationship |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. All or nothing response |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Stimulatory response at low concentrations and detrimental effects at higher concentrations |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Stimulation at low concentrations but no significant effect at higher concentrations |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Interrupted concentration-response: significant effects bracketed by non-significant effects |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Interrupted concentration-response: non-significant effects bracketed by significant effects |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Significant effects only at highest concentration |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Significant effects at all test concentrations but flat concentration-response curve |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Significant effects at all test concentrations with a sloped concentration-response curve |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. Inverse concentration-response relationship |

The concentration-response relationship was reviewed according to the above guidance document and the following determination was made:

Survival Growth

- | | | |
|-------------------------------------|-------------------------------------|---|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 1. Results are reliable and reportable. |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Results are anomalous. An explanation is provided in the body of the report. |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Results are inconclusive. A retest with fresh samples is required. An explanation is provided in the body of the report. |

Whole Effluent Toxicity Testing Report Conclusions and Notes

Client Name/Project: Pine Brook Country Club Test Date: 7/18/16

Sample ID: Effluent

Your results were as follows:

- Passed all whole effluent toxicity permit limits
- Failed the following permit limit(s): *C. dubia*: LC50 C-NOEC *P. promelas*: LC50 C-NOEC
Please proceed according to the instructions in your permit.
- Original Test Invalid – **Valid retest performed. Both test and retest results are attached.**
- A retest using fresh samples must be performed within 30 days of the initial test completion date (____) due to the test condition described below. See next page for further explanation.
- Test Invalid due to: Diluent toxicity Synthetic control toxicity
- Test not sufficiently sensitive. PMSD exceeds upper bound.
- Results are inconclusive due to an unusual concentration-response relationship.
- Available information is insufficient to determine whether this test passed or failed. Please compare results to your permit limits. Please submit a current copy of your permit to the NEB Lab so that we can determine the status of future tests results and help ensure your compliance with permit requirements.
- Additional testing for metals was required on the second and third effluent samples due to the following:
- Renewal sample(s) were of sufficient potency to cause lethality to 50% or more of the test organisms:
Sample #: 2 3 Species: Cd Pp Conc.: 6.25% 12.5% 25% 50% 100% ____%
- The test failed its permit limit for: *C. dubia*: LC50 C-NOEC *P. promelas*: LC50 C-NOEC

Diluent Toxicity:

- Testing will be or has been performed according to the Case 1 Protocols outlined in the attached copy of EPA-New England's species-specific, self-implementing policy for alternate dilution water.
- Retesting will be or has been performed according to the Case 1 Protocols outlined in the attached copy of EPA-New England's species-specific, self-implementing policy for alternate dilution water.
- This is your _____ case of dilution water toxicity. Please proceed according to the Case 2 Protocols outlined in the attached copy of EPA-New England's species-specific, self-implementing policy for alternate dilution water. The alternate dilution water you select for future tests for this species should be described as follows: "synthetic laboratory water made up according to EPA's toxicity test protocols, by adding specified amounts of salts into deionized water in order to match the hardness of our receiving water." Writing this letter should help you to avoid retests in the future.

Sampling Requirements:

A minimum of 3 samples were collected. Yes. No. See explanation on next page.

Samples were first used within 36 hours of collection. Yes. No. See explanation on next page.

Dechlorination Procedures: Chlorine was measured using 4500 CL-G DPD Colorimetric Method.

Dechlorination was not required.

Sample was dechlorinated to _____ mg/L by adding sodium thiosulfate to the sample prior to test initiation. A dechlorinated control of diluent water spiked with sodium thiosulfate equal in proportion to the amount added to the effluent sample was included in the test series.

Chlorine elevated due to interference. Chlorine was _____ mg/L after interference check.

Total Residual Chlorine was re-measured following aeration, and was found to be ____ mg/L.

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION (Permittee)

I certify under penalty of law that this document and all ATTACHMENTS were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on _____

[Date]

[Authorized Signature]

[Print or Type Name and Title]

[Print or Type the Permittee's Name]

[Print or Type the NPDES Permit No.]

Since the WET test and report check is complicated, the New England Bioassay Aquatic Toxicity Laboratory has certified the validity of the WET test data in the section below. Please note that this does not relieve the permittee from its responsibility to sign and certify the report under 40 C.F.R. S 122.41(k).

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION (Bioassay Laboratory)

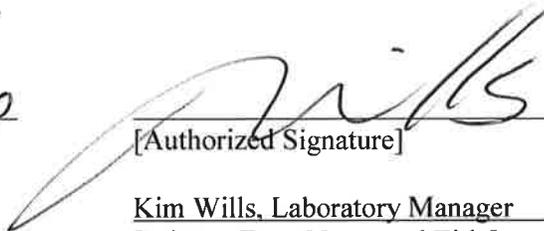
I certify under penalty of law that this document and all ATTACHMENTS were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on _____

[Date]

8/17/16

[Authorized Signature]



Kim Wills, Laboratory Manager
[Print or Type Name and Title]

New England Bioassay, a division of GZA
[Print or Type Name of Bioassay Laboratory]

24. Telephone Contacts

If you have questions, please contact Joy Hilton, Water Technical Unit, at (617) 918-1877 or David McDonald, Ecosystem Assessment Unit, at (617) 918-8609.

NEW ENGLAND BIOASSAY TOXICITY DATA FORM
CHRONIC COVER SHEET

CLIENT: Pine Brook Country Club
 ADDRESS: 42 Newton Street
Weston, MA 02193
 SAMPLE TYPE: Effluent
 DILUTION WATER: Laboratory Synthetic Softwater

C.dubia TEST ID # 16-942a
 COC # C36-2534/35
 PROJECT # 05.0752101.00

INVERTEBRATES

TEST SET UP (TECH INIT) PD
 TEST SPECIES *Ceriodaphnia dubia*
 NEB LOT# Cd16 (RMH 160)
 AGE < 24 hours
 TEST SOLUTION VOLUME (mls) 15
 NO. ORGANISMS PER TEST CHAMBER 1
 NO. ORGANISMS PER CONCENTRATION 10

Laboratory Control Water (SRCF)

Batch Number	Hardness mg/L CaCO ₃	Alkalinity mg/L CaCO ₃
C36-S011	46	30

	DATE	TIME
TEST START:	7/18/16	1500
TEST END:	7/24/16	1435

Results of *Ceriodaphnia dubia* Chronic Test

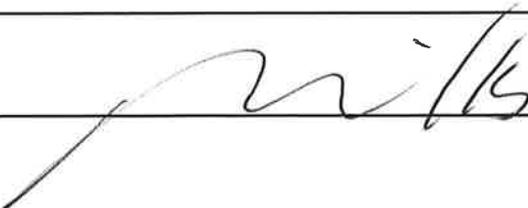
95% Confidence
Limits

48 Hour LC50	>100%	100%±∞
7 Day LC50	>100%	100%±∞
Survival NOEC	100%	
Survival LOEC	>100%	
Reproduction NOEC	100%	
Reproduction LOEC	>100%	
Reproduction IC ₂₅	>100%	

NOEC: NO OBSERVABLE EFFECT CONCENTRATION LOEC: LOWEST OBSERVABLE EFFECT CONCENTRATION

Comments:

REVIEWD BY:



DATE:

8/17/16

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS: Pine Brook Country Club, 42 Newton Street, Weston, MA 02193			
NEB PROJECT NUMBER: 05.0752101.00		NEB TEST NUMBER: 16-942a	COC # C36-2534/35
TEST ORGANISM: <i>Ceriodaphnia dubia</i>		AGE: <24 hours	Lot # Cd16 (RMH 160)
START DATE: 7/18/16	TIME: 1500	END DATE: 7/24/16	TIME: 1435

Effluent Concentration	Culture Lot# Cd16 (RMH 160)											Total Live Young	# Live Adults	Analyst-Transfer	Analyst-Counts
	Cup #	A3	A5	A6	A8	A12	B1	B2	B6	B9	B12				
	Day Number	Replicate													
	A	B	C	D	E	F	G	H	I	J					
NEB Lab Synthetic Diluent	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10	PD	
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10	ER	
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10	PD	
	3	4	5	5	4	4	4	2	3	✓	5	36	10	CW	CW
	4	3	✓	✓	6	5	✓	✓	✓	3	✓	17	10	MV	MV
	5	✓	9	10	✓	✓	9	8	9	12	9	66	10	PD	PD
	6	11	12	14	12	11	16	14	13	14	11	128	10	PD	PD
	7														
	totals	18	26	29	22	20	29	24	25	29	25	247	10		MG
Pine Brook Control		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	5	4	5	5	6	6	✓	✓	✓	5	36	10		
	4	✓	✓	✓	11	12	✓	3	4	4	✓	34	10		
	5	✓	10	10	✓	✓	11	11	11	10	12	75	10		
	6	15	15	14	12	16	17	15	16	13	15	148	10		
	7														
totals	20	29	29	28	34	34	29	31	27	32	293	10			
6.25%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	5	4	5	5	5	4	✓	✓	4	5	37	10		
	4	9	✓	✓	8	✓	✓	4	✓	✓	✓	21	10		
	5	✓	6	9	✓	✓	7	11	10	8	9	60	10		
	6	13	11	17	13	14	14	17	14	12	14	139	10		
	7														
totals	27	21	31	26	19	25	32	24	24	28	257	10			

Notes: _____

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS:	Pine Brook Country Club, 42 Newton Street, Weston, MA 02193		
NEB PROJECT NUMBER:	05.0752101.00	ORGANISM: <i>Ceriodaphnia dubia</i>	START DATE: 7/18/16

Effluent Concentration	Day Number	Replicate										Total Live Young	# Live Adults	Analyst-Transfer	Analyst-Counts
		A	B	C	D	E	F	G	H	I	J				
12.5%	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	4	4	4	5	5	5	✓	5	4	4	40	10		
	4	4	✓	✓	8	7	5	5	✓	✓	✓	29	10		
	5	✓	10	8	✓	✓	✓	10	7	6	10	51	10		
	6	10	13	14	13	12	12	✓	10	9	15	108	10		
	7														
	totals	18	27	26	26	24	22	15	22	19	29	228	10		
25%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	3	4	4	5	5	4	✓	✓	✓	5	30	10		
	4	✓	✓	✓	7	✓	✓	5	✓	5	✓	17	10		
	5	7	10	10	1	8	9	9	8	9	10	81	10		
	6	13	15	15	13	15	12	10	14	13	16	136	10		
	7														
totals	23	29	29	26	28	25	24	22	27	31	264	10			
50%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	4	5	4	4	5	5	2	3	3	5	40	10		
	4	5	✓	✓	8	✓	✓	✓	✓	✓	✓	13	10		
	5	✓	9	12	✓	10	12	11	8	9	10	81	10		
	6	9	17	17	12	15	13	18	16	13	17	147	10		
	7														
totals	18	31	33	24	30	30	31	27	25	32	281	10			
100%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	5	6	5	5	3	5	4	4	6	4	47	10		
	4	10	✓	✓	9	6	✓	✓	✓	10	11	46	10		
	5	✓	12	9	✓	✓	10	9	9	✓	✓	49	10		
	6	14	13	14	✓	13	15	13	15	15	13	125	10		
	7														
totals	29	31	28	14	22	30	26	28	31	28	267	10			

CETIS Analytical Report

Report Date: 05 Aug-16 10:01 (p 1 of 6)
 Test Code: 16-942a | 02-3605-3170

Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID: 05-4721-2944	Endpoint: 2d Survival Rate	CETIS Version: CETISv1.9.2
Analyzed: 05 Aug-16 10:00	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes
Batch ID: 02-0444-7185	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 18 Jul-16 15:00	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Jul-16 14:35	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d	Source: In-House Culture	Age: <24h
Sample ID: 02-4312-3283	Code: E7DC453	Client: Pine Brook Country Club
Sample Date: 18 Jul-16 09:00	Material: WWTF Effluent	Project:
Receipt Date: 18 Jul-16 12:07	Source: Pine Brook Country Club (MA0032212)	
Sample Age: 6h	Station:	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	1487023	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
LC50	>100	n/a	n/a	<1	n/a	n/a

2d Survival Rate Summary

Calculated Variate(A/B)

Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	D	10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
6.25		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
12.5		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
25		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
50		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
100		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10

2d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

2d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 05 Aug-16 10:01 (p 2 of 6)
Test Code: 16-942a | 02-3605-3170

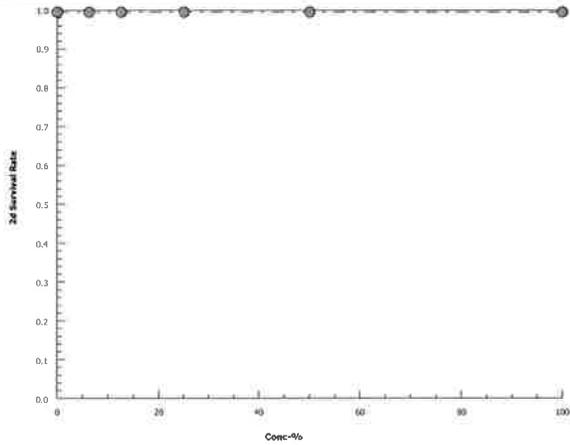
Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID: 05-4721-2944 Endpoint: 2d Survival Rate
Analyzed: 05 Aug-16 10:00 Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.9.2
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 05 Aug-16 10:01 (p 3 of 6)
 Test Code: 16-942a | 02-3605-3170

Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID: 03-5558-1771	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.9.2
Analyzed: 05 Aug-16 10:00	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes
Batch ID: 02-0444-7185	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 18 Jul-16 15:00	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Jul-16 14:35	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d	Source: In-House Culture	Age: <24h
Sample ID: 02-4312-3283	Code: E7DC453	Client: Pine Brook Country Club
Sample Date: 18 Jul-16 09:00	Material: WWTF Effluent	Project:
Receipt Date: 18 Jul-16 12:07	Source: Pine Brook Country Club (MA0032212)	
Sample Age: 6h	Station:	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	1225675	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	1	0.8	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
LC50	>100	n/a	n/a	<1	n/a	n/a

7d Survival Rate Summary

Calculated Variate(A/B)

Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	D	10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
6.25		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
12.5		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
25		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
50		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
100		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 05 Aug-16 10:01 (p 4 of 6)
Test Code: 16-942a | 02-3605-3170

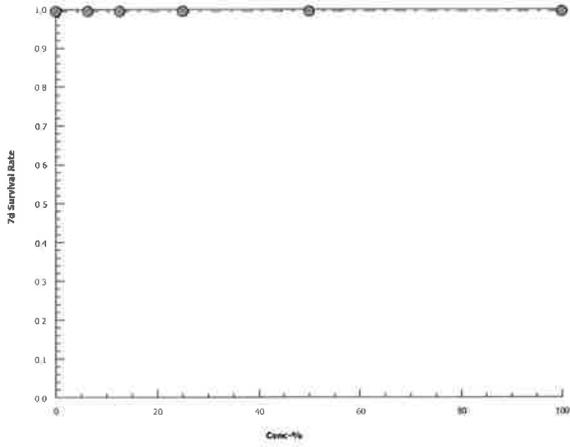
Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID: 03-5558-1771 Endpoint: 7d Survival Rate
Analyzed: 05 Aug-16 10:00 Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.9.2
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 05 Aug-16 10:01 (p 5 of 6)
 Test Code: 16-942a | 02-3605-3170

Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID: 16-0996-0658	Endpoint: Reproduction	CETIS Version: CETISv1.9.2
Analyzed: 05 Aug-16 10:01	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes
Batch ID: 02-0444-7185	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 18 Jul-16 15:00	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Jul-16 14:35	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d	Source: In-House Culture	Age: <24h
Sample ID: 02-4312-3283	Code: E7DC453	Client: Pine Brook Country Club
Sample Date: 18 Jul-16 09:00	Material: WWTF Effluent	Project:
Receipt Date: 18 Jul-16 12:07	Source: Pine Brook Country Club (MA0032212)	
Sample Age: 6h	Station:	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1366923	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	24.7	15	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Reproduction Summary

Calculated Variate

Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	10	24.7	18	29	1.212	3.831	15.51%	0.0%
6.25		10	25.7	19	32	1.283	4.057	15.78%	-4.05%
12.5		10	22.8	15	29	1.405	4.442	19.48%	7.69%
25		10	26.4	22	31	0.9214	2.914	11.04%	-6.88%
50		10	28.1	18	33	1.464	4.63	16.48%	-13.77%
100		10	26.7	14	31	1.64	5.187	19.43%	-8.1%

Reproduction Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	18	26	29	22	20	29	24	25	29	25
6.25		27	21	31	26	19	25	32	24	24	28
12.5		18	27	26	26	24	22	15	22	19	29
25		23	29	29	26	28	25	24	22	27	31
50		18	31	33	24	30	30	31	27	25	32
100		29	31	28	14	22	30	26	28	31	28

CETIS Analytical Report

Report Date: 05 Aug-16 10:01 (p 6 of 6)
Test Code: 16-942a | 02-3605-3170

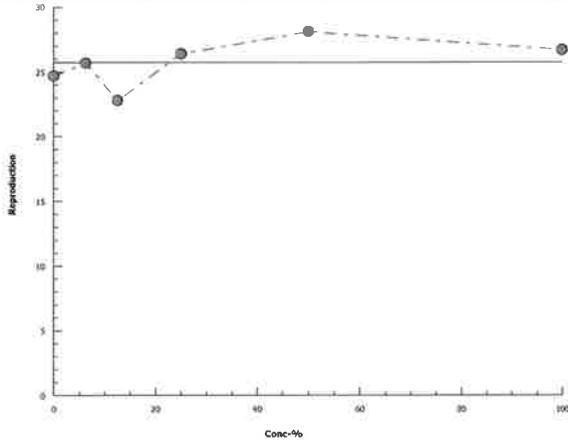
Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID: 16-0996-0658 Endpoint: Reproduction
Analyzed: 05 Aug-16 10:01 Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.9.2
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 05 Aug-16 10:01 (p 1 of 2)
 Test Code: 16-942a | 02-3605-3170

Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID: 00-1133-8773	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.9.2
Analyzed: 05 Aug-16 10:00	Analysis: STP 2xK Contingency Tables	Official Results: Yes
Batch ID: 02-0444-7185	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 18 Jul-16 15:00	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Jul-16 14:35	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d	Source: In-House Culture	Age: <24h
Sample ID: 02-4312-3283	Code: E7DC453	Client: Pine Brook Country Club
Sample Date: 18 Jul-16 09:00	Material: WWTF Effluent	Project:
Receipt Date: 18 Jul-16 12:07	Source: Pine Brook Country Club (MA0032212)	
Sample Age: 6h	Station:	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	> 100	n/a	1

Fisher Exact/Bonferroni-Holm Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Dilution Water		6.25	1.0000	Exact	1.0000	Non-Significant Effect
		12.5	1.0000	Exact	1.0000	Non-Significant Effect
		25	1.0000	Exact	1.0000	Non-Significant Effect
		50	1.0000	Exact	1.0000	Non-Significant Effect
		100	1.0000	Exact	1.0000	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	1	0.8	>>	Yes	Passes Criteria

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	D	10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		10	0	10	1	0	0.0%
100		10	0	10	1	0	0.0%

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

CETIS Analytical Report

Report Date: 05 Aug-16 10:01 (p 2 of 2)
Test Code: 16-942a | 02-3605-3170

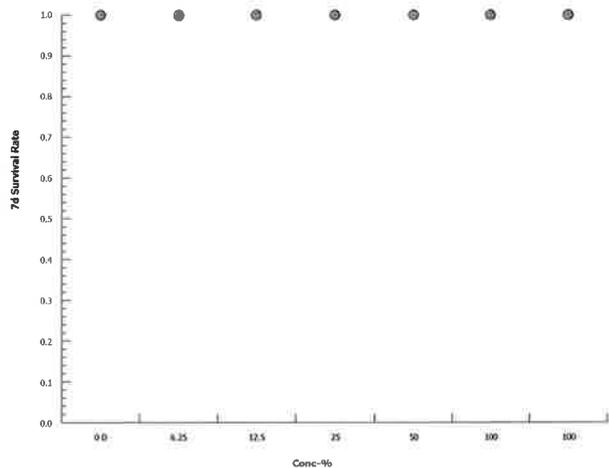
Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID: 00-1133-8773 Endpoint: 7d Survival Rate
Analyzed: 05 Aug-16 10:00 Analysis: STP 2xK Contingency Tables

CETIS Version: CETISv1.9.2
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 05 Aug-16 10:01 (p 1 of 2)
 Test Code: 16-942a | 02-3605-3170

Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID: 04-6994-6929	Endpoint: Reproduction	CETIS Version: CETISv1.9.2
Analyzed: 05 Aug-16 10:00	Analysis: Parametric-Control vs Treatments	Official Results: Yes
Batch ID: 02-0444-7185	Test Type: Reproduction-Survival (7d)	Analyst:
Start Date: 18 Jul-16 15:00	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 24 Jul-16 14:35	Species: Ceriodaphnia dubia	Brine: Not Applicable
Duration: 6d	Source: In-House Culture	Age: <24h
Sample ID: 02-4312-3283	Code: E7DC453	Client: Pine Brook Country Club
Sample Date: 18 Jul-16 09:00	Material: WWTF Effluent	Project:
Receipt Date: 18 Jul-16 12:07	Source: Pine Brook Country Club (MA0032212)	
Sample Age: 6h	Station:	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	> 100	n/a	1	17.56%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		6.25	-0.5278	2.289	4.337	18	CDF	0.9447	Non-Significant Effect
		12.5	1.003	2.289	4.337	18	CDF	0.4153	Non-Significant Effect
		25	-0.8973	2.289	4.337	18	CDF	0.9789	Non-Significant Effect
		50	-1.795	2.289	4.337	18	CDF	0.9989	Non-Significant Effect
		100	-1.056	2.289	4.337	18	CDF	0.9867	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	24.7	15	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	166.533	33.3067	5	1.856	0.1175	Non-Significant Effect
Error	969.2	17.9481	54			
Total	1135.73		59			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	3.104	15.09	0.6840	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.947	0.9459	0.0113	Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	24.7	21.96	27.44	25	18	29	1.212	15.51%	0.00%
6.25		10	25.7	22.8	28.6	25.5	19	32	1.283	15.78%	-4.05%
12.5		10	22.8	19.62	25.98	23	15	29	1.405	19.48%	7.69%
25		10	26.4	24.32	28.48	26.5	22	31	0.9214	11.04%	-6.88%
50		10	28.1	24.79	31.41	30	18	33	1.464	16.48%	-13.77%
100		10	26.7	22.99	30.41	28	14	31	1.64	19.43%	-8.10%

Reproduction Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	18	26	29	22	20	29	24	25	29	25
6.25		27	21	31	26	19	25	32	24	24	28
12.5		18	27	26	26	24	22	15	22	19	29
25		23	29	29	26	28	25	24	22	27	31
50		18	31	33	24	30	30	31	27	25	32
100		29	31	28	14	22	30	26	28	31	28

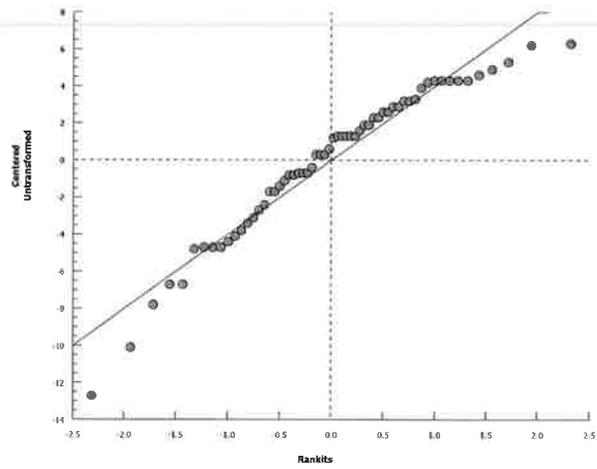
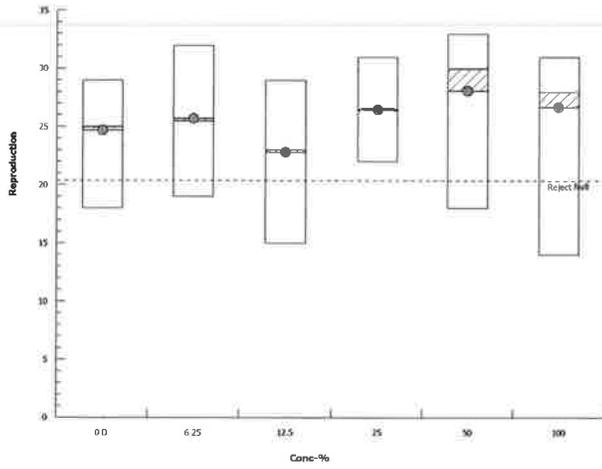
Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analysis ID: 04-6994-6929 Endpoint: Reproduction
Analyzed: 05 Aug-16 10:00 Analysis: Parametric-Control vs Treatments

CETIS Version: CETISv1.9.2
Official Results: Yes

Graphics



Brood mother source: RMH 149-A8 Source's brood size: 18 (Qty.)

Pinebrook Country Club, 7-18-16

Tech	LC	LC	LC	LC	LC		SIP	LC								
Date	7/11	7/12	7/13	7/14	7/15		7/17	7/18								
Day acc.	0	1	2	3	4	5	6	7		8	9	10	11	12	13	14
Cup #																
1	N	N	N	N	3		2y	17 T1	1							
2	N	N	N	N	2			15 T2	2							
3	N	N	N	N	2			21 T3 (T1)	3							
4	N	N	N	N	2			y	4							
5	N	N	N	N	3			14 (T2)	5							
6	N	N	N	N	2			14 (T3)	6							
7	N	N	N	N	3			16 T4	7							
8	N	N	N	N	3			13 (T4)	8							
9	N	N	N	N	2			y	9							
10	N	N	N	N	4			y	10							
11	N	N	N	N	3			13 T5	11							
12	N	N	N	N	3			19 T6 (T5)	12							
13	N	N	N	N	4		↓	y	13							

Y = neonates present, and criterion has been met: ≥ 20 neonates produced in total by 3rd brood. **N** = no neonates
2B = two broods present. **2Y** = two broods and criterion met: ≥ 20 neos. by 3rd brood. **X** = brood mother dead **ae** = aborted eggs
✓ or **P** = neonates present after renewal on previous day (see time in log). **A→** = acceptable for acute testing only
T# = neonates used in test, replicate number of test noted (and brood counted). **acc.** = if acclimated, H₂O type used w/ renewal this day.

Test organism collection:

Project #	Tray diagram used?	Symbols (✓/P) (Y/N)	Time period, neonates released	Collection date / time
0044702	T	— y	7-17-16 / 1600 → 1935	7-18-16 / 1245
0752101	(T)	— y	7-17-16 / 1600 → 1935	7-18-16 / 1245
	T			
	T			
	T			
	T			

Ceriodaphnia dubia

410

Culture Chart

Lot # cd16 (RMH160) B

Brood mother source: RMH 149-137^{LC} Source's brood size: 18 (Qty.)

Pinebrook Country Club, 7-18-16

Tech	LC	LC	MG	LC	LC		SP	LC								
Date	7/11	7/12	7/13	7/14	7/15		7/17	7/18								
Day acc.	0	1	2	3	4	5	6	7		8	9	10	11	12	13	14
Cup #																
1	N	N	N	N	4		24	15 T7	1							
2	N	N	N	N	3		1	13 T7	2							
3	N	N	N	N	4			13 T8	3							
4	N	N	N	N	3			Y	4							
5	N	N	N	N	3			Y	5							
6	N	N	N	N	3			17 T8	6							
7	N	N	N	N	4			16 T9	7							
8	N	N	N	N	4			19	8							
9	N	N	N	N	3			15 T9	9							
10	N	N	N	N	4			16 T10	10							
11	N	N	N	N	2			Y	11							
12	N	N	N	N	5			16 T10	12							
13	N	N	N	N	3		↓	Y	13							

Y = neonates present, and criterion has been met: ≥ 20 neonates produced in total by 3rd brood.

N = no neonates

2B = two broods present. 2Y = two broods and criterion met: ≥ 20 neos. by 3rd brood.

X = brood mother dead ae = aborted eggs

✓ or P = neonates present after renewal on previous day (see time in log).

A→ = acceptable for acute testing only

T# = neonates used in test, replicate number of test noted (and brood counted).

acc. = if acclimated, H₂O type used w/ renewal this day.

Test organism collection:

Tray diagram used?

Project #	Symbols (✓/P)	(Y/N)	Time period, neonates released	Collection date / time
0044702	T -	Y	7-17-16 / 1600 → 1935	7-18-16 / 1245
0752101	(T) -	Y	7-17-16 / 1600 → 1935	7-18-16 / 1245
	T			
	T			
	T			
	T			

NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS: <u>Pine Brook Country Club, 42 Newton Street, Weston, MA 02193</u>								
NEB PROJECT NUMBER: <u>05.0752101.00</u>			TEST ORGANISM: <u><i>Ceriodaphnia dubia</i></u>					
DILUTION WATER SOURCE: <u>Laboratory Synthetic Softwater</u>			START DATE: <u>7/18/16</u>			TIME: <u>1500</u>		
ANALYST	MV	CB	MV	MV	CW	ER		
NEB Lab Synthetic Diluent	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.0	25.4	24.8	25.5	25.1	25.1		
D.O. mg/L Initial	8.4	8.2	8.0	8.2	8.3	8.1		
pH s.u. Initial	7.5	7.4	7.3	7.5	7.5	7.4		
Conductivity µS Initial	175	175	176	175	175	177		
Temp °C Final	24.5	25.1	25.4	24.2	24.6	24.4		
D.O. mg/L Final	8.3	7.6	8.4	8.2	8.6	8.4		
pH s.u. Final	7.5	7.7	8.2	8.0	8.2	8.0		
Conductivity µS Final	190	189	194	199	190	191		
Pine Brook Control	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.3	24.7	24.5	25.4	25.8	24.9		
D.O. mg/L Initial	8.7	8.5	6.8	8.4	7.3	8.0		
pH s.u. Initial	7.0	6.9	6.9	7.1	7.0	6.9		
Conductivity µS Initial	709	703	724	719	713	714		
Temp °C Final	24.5	25.1	25.6	24.1	24.8	24.3		
D.O. mg/L Final	8.2	7.7	8.5	8.1	8.6	8.5		
pH s.u. Final	7.5	7.5	7.6	7.9	8.2	8.1		
Conductivity µS Final	712	703	704	723	704	715		
6.25%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	26.0	25.4	24.2	25.4	25.3	25.1		
D.O. mg/L Initial	7.6	8.2	7.9	8.3	7.6	8.1		
pH s.u. Initial	7.3	7.3	7.2	7.4	7.3	7.4		
Conductivity µS Initial	229	234	231	234	236	230		
Temp °C Final	24.4	24.9	25.7	24.1	24.8	24.4		
D.O. mg/L Final	8.2	7.4	8.5	7.9	8.5	8.6		
pH s.u. Final	7.7	7.8	8.1	7.9	8.4	8.2		
Conductivity µS Final	256	266	262	281	264	261		
12.5%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.6	25.6	24.9	25.4	25.3	25.2		
D.O. mg/L Initial	8.0	8.2	7.8	8.2	8.0	8.1		
pH s.u. Initial	7.5	7.5	7.2	7.4	7.4	7.6		
Conductivity µS Initial	289	293	282	289	289	289		
Temp °C Final	24.4	25.0	25.7	24.1	24.9	24.4		
D.O. mg/L Final	8.2	7.5	8.5	8.0	8.6	8.6		
pH s.u. Final	7.7	7.8	8.1	7.9	8.4	8.2		
Conductivity µS Final	305	302	293	310	302	306		

NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS: <u>Pine Brook Country Club, 42 Newton Street, Weston, MA 02193</u>								
NEB PROJECT NUMBER: <u>05.0752101.00</u>			TEST ORGANISM: <u>Ceriodaphnia dubia</u>					
DILUTION WATER SOURCE: <u>Laboratory Synthetic Softwater</u>			START DATE: <u>7/18/16</u>			TIME: <u>1500</u>		
25%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.6	25.7	24.9	25.3	25.1	25.1		
D.O. mg/L Initial	8.0	8.1	7.3	8.3	7.8	8.1		
pH s.u. Initial	7.5	7.7	7.3	7.4	7.5	7.7		
Conductivity µS Initial	405	407	404	396	400	392		
Temp °C Final	24.5	24.9	25.7	24.1	25.0	24.4		
D.O. mg/L Final	8.2	7.6	8.6	8.1	8.7	8.5		
pH s.u. Final	7.7	7.8	8.1	8.0	8.5	8.3		
Conductivity µS Final	417	421	408	410	406	403		
50%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.8	26.0	24.8	25.4	25.1	25.1		
D.O. mg/L Initial	7.4	8.1	6.7	8.0	7.3	7.9		
pH s.u. Initial	7.6	7.7	7.4	7.5	7.6	7.9		
Conductivity µS Initial	629	629	621	620	614	613		
Temp °C Final	24.5	24.8	25.6	24.2	25.1	24.4		
D.O. mg/L Final	8.2	7.5	8.7	8.1	8.7	8.5		
pH s.u. Final	8.0	7.8	8.3	8.2	8.6	8.5		
Conductivity µS Final	632	637	618	627	614	622		
100%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	26.0	26.0	24.7	25.4	25.1	25.1		
D.O. mg/L Initial	4.5	7.9	7.6	7.7	5.8	7.6		
pH s.u. Initial	7.6	7.7	7.6	7.6	4.2	8.0		
Conductivity µS Initial	1,075	1,075	1,061	1,050	1,043	1,046		
Temp °C Final	24.6	24.8	25.6	24.2	25.1	24.4		
D.O. mg/L Final	8.2	7.6	8.7	7.8	8.7	8.6		
pH s.u. Final	8.3	8.3	8.4	8.5	8.7	8.6		
Conductivity µS Final	1,065	1,073	1,042	1,079	1,029	1,045		
	1	2	3	4	5	6	7	Remarks
Temp °C Initial								
D.O. mg/L Initial								
pH s.u. Initial								
Conductivity µS Initial								
Temp °C Final								
D.O. mg/L Final								
pH s.u. Final								
Conductivity µS Final								

Table of Random Permutations of 16

C.dubia Test ID#

16-942a

7	12	15	15	1	2	7	16	10	2	14	15	7	13	13	10	6	1	8	10
13	3	8	16	7	10	11	10	13	5	11	7	13	16	7	7	5	13	2	14
3	1	4	5	14	13	3	14	9	13	13	2	9	15	6	2	8	4	5	8
11	8	16	14	15	6	2	6	2	16	8	5	12	3	9	13	4	3	10	4
14	9	1	6	3	9	14	13	8	6	5	8	14	7	3	15	13	11	4	7
2	16	10	13	5	5	13	2	11	7	3	12	5	14	12	16	2	2	9	15
4	6	13	7	2	15	1	9	1	4	7	10	6	9	11	9	7	6	16	11
6	14	6	10	4	14	4	15	3	3	4	16	2	6	5	1	12	10	6	9
10	15	2	1	13	12	16	3	4	8	10	1	15	5	14	12	14	12	3	2
12	10	7	12	9	11	9	8	12	14	15	4	11	8	16	8	9	14	14	1
15	7	5	2	10	7	8	12	6	15	6	13	16	12	15	4	11	8	12	6
16	2	11	8	8	8	15	5	16	1	1	9	8	1	8	14	16	5	13	5
9	13	14	3	6	4	10	11	5	12	9	3	10	4	4	3	10	9	1	3
8	11	9	4	11	3	12	7	7	10	12	14	3	10	1	6	15	16	15	12
1	5	12	11	16	16	5	4	14	9	16	11	1	2	10	5	1	15	7	13
5	4	3	9	12	1	6	1	15	11	2	6	4	11	2	11	3	7	11	16
11	8	16	5	5	13	1	13	2	16	14	12	9	8	7	5	13	3	13	3
2	2	8	8	14	16	4	3	8	11	10	14	15	1	2	11	4	5	15	9
6	13	2	13	6	5	9	15	11	10	12	6	16	15	16	9	10	12	16	15
14	12	4	16	16	11	14	10	5	12	3	3	12	14	15	13	6	4	1	16
8	6	3	9	4	10	6	4	16	2	2	9	8	16	4	6	5	15	7	8
9	15	12	10	3	2	12	6	1	15	4	13	7	7	9	12	14	8	8	11
3	10	11	12	13	12	5	11	7	8	9	5	14	11	10	1	3	13	3	5
16	1	13	14	8	14	15	5	3	7	11	15	6	12	5	7	11	1	14	4
1	14	14	2	9	15	16	14	6	14	7	8	3	13	11	8	7	7	12	7
4	4	6	4	12	3	11	8	15	9	8	1	13	6	3	3	15	9	9	12
15	5	1	11	10	6	3	7	10	5	5	11	10	10	12	15	16	14	5	2
5	3	5	6	7	7	13	2	14	3	16	4	5	5	13	4	9	16	2	6
12	7	15	15	15	9	8	12	12	13	15	10	1	4	6	16	2	6	11	1
10	11	10	3	2	4	2	1	4	6	6	7	11	9	14	10	8	11	4	13
7	9	7	7	11	1	7	16	13	1	13	2	4	2	1	2	12	2	10	14
13	16	9	1	1	8	10	9	9	4	1	16	2	3	8	14	1	10	6	10
				rep															
				8	6	5	2	8	15	4	6	6	1	4	5	7	13	2	10
				11	15	9	10	1	3	8	2	15	7	9	8	16	1	14	3
				12	9	16	11	7	1	7	16	11	8	3	3	12	2	3	4
				5	5	4	13	6	8	15	5	12	5	7	16	5	11	8	1
				15	2	1	14	16	5	14	9	2	16	1	12	6	14	4	13
				14	16	6	9	3	4	16	14	3	15	11	11	3	9	12	5
				13	7	13	1	11	14	9	10	16	2	10	2	10	7	10	16
				4	13	8	3	5	13	10	12	5	12	5	14	13	16	5	6
				9	12	2	4	13	10	3	13	14	4	2	1	14	8	6	12
				10	1	3	12	4	2	2	4	13	3	16	9	9	3	7	14
				3	11	15	8	2	7	11	7	8	14	6	4	4	4	15	11
				2	14	7	15	14	16	13	1	9	10	12	10	11	10	9	8
				6	4	11	7	10	11	6	8	4	9	8	15	8	6	11	9
				1	8	10	6	15	12	1	11	7	11	13	6	1	15	13	15
				16	10	14	16	9	6	12	3	10	6	14	7	2	12	16	7
				7	3	12	5	12	9	5	15	1	13	15	13	15	5	1	2
13	4	10	4	16	13	16	13	5	3	6	14	1	16	8	7	2	3	3	12
5	14	4	6	8	2	15	1	13	14	16	4	15	4	3	12	12	1	4	7
2	2	2	15	14	16	9	12	16	6	10	15	14	9	10	1	14	8	8	16
7	12	15	8	12	3	5	14	7	12	5	13	16	1	7	5	11	2	9	3
6	9	7	14	9	14	10	11	15	11	12	1	12	12	14	16	3	11	11	8
14	5	16	7	10	8	11	8	14	13	7	11	6	3	11	4	4	6	6	9
15	11	8	9	7	12	8	7	1	15	9	3	3	7	13	11	10	4	5	1
11	6	6	1	4	1	3	16	12	5	4	9	13	13	6	8	15	9	1	14
4	10	3	16	2	11	7	9	6	9	1	8	4	11	5	2	16	10	12	4
1	8	1	13	1	15	4	4	11	4	2	16	5	8	1	9	5	12	16	6
9	7	14	2	6	4	14	10	9	8	15	10	7	10	9	10	6	14	10	11
12	1	9	10	15	5	2	15	10	2	14	2	8	2	4	13	8	5	15	5
3	3	12	11	5	9	6	6	3	10	13	12	9	6	2	15	7	15	7	13
10	15	11	5	13	7	12	5	2	7	11	5	10	15	12	3	1	13	13	10
8	13	13	3	3	10	13	2	4	1	8	6	11	14	15	6	9	16	2	2
16	16	5	12	11	6	1	3	8	16	3	7	2	5	16	14	13	7	14	15

NEW ENGLAND BIOASSAY TOXICITY DATA FORM
CHRONIC COVER SHEET

CLIENT: Pine Brook Country Club
 ADDRESS: 42 Newton Street
Weston, MA 02193
 SAMPLE TYPE: Effluent
 DILUTION WATER: Laboratory Synthetic Softwater

P.promelas TEST ID # 16-942b
 COC # C36-2534/35
 PROJECT # 05.0752101.00

VERTEBRATES

TEST SET UP (TECH INIT) ER
 TEST SPECIES *Pimephales promelas*
 NEB LOT# Pp16 (7-18)
 AGE < 24 hours
 TEST SOLUTION VOLUME (mls) 400
 NO. ORGANISMS PER TEST CHAMBER 10
 NO. ORGANISMS PER CONCENTRATION 40

Laboratory Control Water (SRCF)

Batch Number	Hardness mg/L CaCO ₃	Alkalinity mg/L CaCO ₃
C36-S011	46	30

	DATE	TIME
TEST START:	7/18/16	1507
TEST END:	7/25/16	1353

Results of *Pimephales promelas* Chronic Test

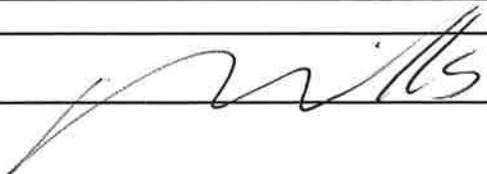
95% Confidence
Limits

48 Hour LC50	>100%	100% ± ∞
7 Day LC50	>100%	100% ± ∞
Survival NOEC	100%	
Survival LOEC	>100%	
Growth NOEC	100%	
Growth LOEC	>100%	
Growth IC ₂₅	>100%	

NOEC: NO OBSERVABLE EFFECT CONCENTRATION LOEC: LOWEST OBSERVABLE EFFECT CONCENTRATION

Comments:

REVIEWED BY:



DATE:

8/17/16

**NEB'S SURVIVAL DATA SHEET FOR FATHEAD MINNOW LARVAL
SURVIVAL AND GROWTH TEST**

FACILITY NAME & ADDRESS: Pine Brook Country Club, 42 Newton Street, Weston, MA 02193
 NEB PROJECT NUMBER: 05.0752101.00 TEST NUMBER: 16-942b COC # C36-2534/35
 TEST ORGANISM: Pimephales promelas AGE: <24 hours Lot # Pp16 (7-18)
 START DATE: 7/18/16 TIME: 1507 END DATE: 7/25/16 TIME: 1353

Effluent Concentration	Replicate Number	Number of Survivors								
		Day								
		0	1	2	3	4	5	6	7	Remarks
	ANALYST	ER	KM	CB	CB	CW	ER	ER	KO	
NEB Lab Synthetic Diluent	A	10	10	10	10	10	10	10	10	
	B	10	10	10	10	10	10	10	10	
	C	10	10	10	10	10	10	10	10	
	D	10	10	10	10	10	10	10	10	
Pine Brook Control	A	10	10	10	10	10	10	10	10	
	B	10	10	10	10	10	10	10	10	
	C	10	10	10	10	10	9	9	9	
	D	10	10	10	9	2	1	1	1	
6.25%	A	10	10	10	10	10	10	10	10	
	B	10	10	10	10	10	10	10	10	
	C	10	10	10	10	9	9	8	7	
	D	10	10	10	10	10	10	9	9	
12.5%	A	10	10	10	10	10	10	10	10	
	B	10	10	10	10	10	10	10	10	
	C	10	10	10	10	10	10	10	10	
	D	10	10	10	10	10	10	9	9	
25%	A	10	10	10	10	10	10	10	10	
	B	10	10	10	10	10	9	9	9	
	C	10	10	10	10	10	10	10	10	
	D	10	10	10	10	10	10	10	10	
50%	A	10	10	10	10	10	9	8	8	
	B	10	10	10	10	10	10	10	10	
	C	10	10	10	10	10	9	9	8	
	D	10	10	10	10	10	10	10	10	
100%	A	10	10	10	10	10	10	10	10	
	B	10	10	10	10	10	10	10	9	
	C	10	10	10	10	10	10	10	10	
	D	10	10	10	10	10	10	9	8	

D.O. concentration fell below 4.0 mg/L _____
 All test solutions were aerated at <100 bubbles/minute as of _____

NEW ENGLAND BIOASSAY WEIGHT DATA FOR FATHEAD MINNOW LARVAL SURVIVAL AND GROWTH TEST

FACILITY NAME & ADDRESS:		Pine Brook Country Club, 42 Newton Street, Weston, MA 02193	
NEB PROJECT #	05.0752101.00	NEB TEST NUMBER:	16-942b
TEST START DATE	7/18/16	WEIGHING DATE:	8/4/16
TEST END DATE	7/25/16		
DRYING TEMPERATURE (°C)	100 ± 4	DRYING TIME:	minimum 6 hours
ANALYST-INITIAL WEIGHTS	CW	ANALYST-FINAL WEIGHTS	CW
Effluent Concentration	Replicate Number	A Weight of boat (mg)	B Dry Weight: Foil and Larvae (mg)
NEB Lab Synthetic Diluent	A	931.62	937.59
	B	927.34	933.31
	C	934.13	940.00
	D	929.38	936.08
Pine Brook Control	A	922.55	929.50
	B	934.40	941.39
	C	925.14	931.91
	D	924.87	926.86
6.25%	A	926.91	932.97
	B	923.36	929.46
	C	920.17	925.31
	D	924.57	930.51
12.5%	A	929.84	936.11
	B	928.42	934.14
	C	931.36	937.29
	D	928.95	934.96
25%	A	926.49	933.16
	B	924.65	931.16
	C	925.45	931.52
	D	927.38	933.61
50%	A	925.40	930.93
	B	928.09	934.73
	C	929.66	935.46
	D	929.08	935.67
100%	A	932.44	939.34
	B	932.02	938.50
	C	931.46	937.64
	D	932.15	937.74

CETIS Analytical Report

Report Date: 05 Aug-16 10:08 (p 1 of 6)
 Test Code: 16-942b | 02-3974-1214

Fathead Minnow 7-d Larval Survival and Growth Test

New England Bioassay

Analysis ID: 11-9507-0254	Endpoint: 2d Survival Rate	CETIS Version: CETISv1.9.2
Analyzed: 05 Aug-16 10:08	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes
Batch ID: 14-5681-8167	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 18 Jul-16 15:07	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 25 Jul-16 13:53	Species: Pimephales promelas	Brine: Not Applicable
Duration: 6d 23h	Source: In-House Culture	Age: <24h
Sample ID: 19-1843-7281	Code: 725907A1	Client: Pine Brook Country Club
Sample Date: 18 Jul-16 09:00	Material: WWTF Effluent	Project:
Receipt Date: 18 Jul-16 12:07	Source: Pine Brook Country Club (MA0032212)	
Sample Age: 6h	Station:	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	841540	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
LC50	>100	n/a	n/a	<1	n/a	n/a

2d Survival Rate Summary

Calculated Variate(A/B)

Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	D	4	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	40	40
6.25		4	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	40	40
12.5		4	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	40	40
25		4	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	40	40
50		4	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	40	40
100		4	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	40	40

2d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

2d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	10/10	10/10	10/10
6.25		10/10	10/10	10/10	10/10
12.5		10/10	10/10	10/10	10/10
25		10/10	10/10	10/10	10/10
50		10/10	10/10	10/10	10/10
100		10/10	10/10	10/10	10/10

CETIS Analytical Report

Report Date: 05 Aug-16 10:08 (p 2 of 6)
Test Code: 16-942b | 02-3974-1214

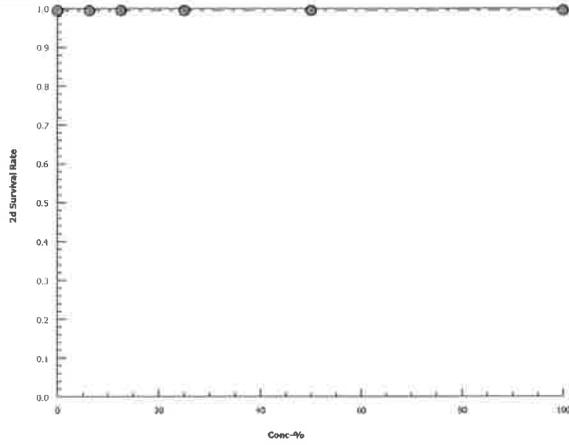
Fathead Minnow 7-d Larval Survival and Growth Test

New England Bioassay

Analysis ID: 11-9507-0254 Endpoint: 2d Survival Rate
Analyzed: 05 Aug-16 10:08 Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.9.2
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 05 Aug-16 10:08 (p 3 of 6)

Test Code: 16-942b | 02-3974-1214

Fathead Minnow 7-d Larval Survival and Growth Test

New England Bioassay

Analysis ID: 05-1055-5982	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.9.2
Analyzed: 05 Aug-16 10:08	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes
Batch ID: 14-5681-8167	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 18 Jul-16 15:07	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 25 Jul-16 13:53	Species: Pimephales promelas	Brine: Not Applicable
Duration: 6d 23h	Source: In-House Culture	Age: <24h
Sample ID: 19-1843-7281	Code: 725907A1	Client: Pine Brook Country Club
Sample Date: 18 Jul-16 09:00	Material: WWTF Effluent	Project:
Receipt Date: 18 Jul-16 12:07	Source: Pine Brook Country Club (MA0032212)	
Sample Age: 6h	Station:	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	123598	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	1	0.8	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
LC50	>100	n/a	n/a	<1	n/a	n/a

7d Survival Rate Summary

Calculated Variate(A/B)

Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	D	4	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	40	40
6.25		4	0.9000	0.7000	1.0000	0.0707	0.1414	15.71%	10.0%	36	40
12.5		4	0.9750	0.9000	1.0000	0.0250	0.0500	5.13%	2.5%	39	40
25		4	0.9750	0.9000	1.0000	0.0250	0.0500	5.13%	2.5%	39	40
50		4	0.9000	0.8000	1.0000	0.0577	0.1155	12.83%	10.0%	36	40
100		4	0.9250	0.8000	1.0000	0.0479	0.0957	10.35%	7.5%	37	40

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	0.7000	0.9000
12.5		1.0000	1.0000	1.0000	0.9000
25		1.0000	0.9000	1.0000	1.0000
50		0.8000	1.0000	0.8000	1.0000
100		1.0000	0.9000	1.0000	0.8000

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	10/10	10/10	10/10
6.25		10/10	10/10	10/10	10/10
12.5		10/10	10/10	10/10	10/10
25		10/10	10/10	10/10	10/10
50		10/10	10/10	10/10	10/10
100		10/10	10/10	10/10	10/10

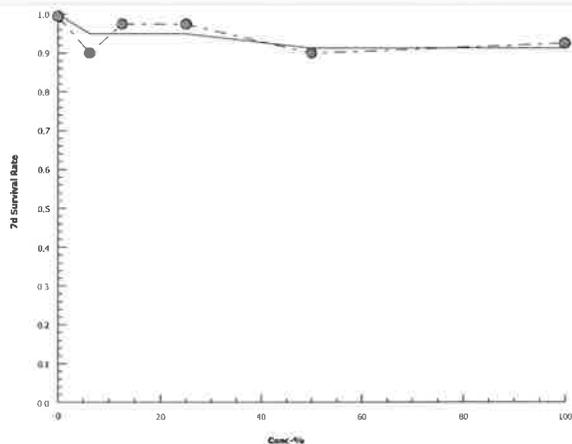
Fathead Minnow 7-d Larval Survival and Growth Test

New England Bioassay

Analysis ID: 05-1055-5982 Endpoint: 7d Survival Rate
Analyzed: 05 Aug-16 10:08 Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.9.2
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 05 Aug-16 10:08 (p 5 of 6)
 Test Code: 16-942b | 02-3974-1214

Fathead Minnow 7-d Larval Survival and Growth Test

New England Bioassay

Analysis ID: 15-6921-9121	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv1.9.2
Analyzed: 05 Aug-16 10:08	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes
Batch ID: 14-5681-8167	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 18 Jul-16 15:07	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 25 Jul-16 13:53	Species: Pimephales promelas	Brine: Not Applicable
Duration: 6d 23h	Source: In-House Culture	Age: <24h
Sample ID: 19-1843-7281	Code: 725907A1	Client: Pine Brook Country Club
Sample Date: 18 Jul-16 09:00	Material: WWTF Effluent	Project:
Receipt Date: 18 Jul-16 12:07	Source: Pine Brook Country Club (MA0032212)	
Sample Age: 6h	Station:	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	646542	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	0.6128	0.25	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Mean Dry Biomass-mg Summary

Calculated Variate

Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	4	0.6128	0.587	0.67	0.01923	0.03846	6.28%	0.0%
6.25		4	0.581	0.514	0.61	0.02259	0.04518	7.78%	5.18%
12.5		4	0.5982	0.572	0.627	0.01137	0.02273	3.80%	2.37%
25		4	0.637	0.607	0.667	0.01351	0.02703	4.24%	-3.96%
50		4	0.614	0.553	0.664	0.02799	0.05598	9.12%	-0.2%
100		4	0.6287	0.559	0.69	0.02754	0.05509	8.76%	-2.61%

Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	0.597	0.597	0.587	0.67
6.25		0.606	0.61	0.514	0.594
12.5		0.627	0.572	0.593	0.601
25		0.667	0.651	0.607	0.623
50		0.553	0.664	0.58	0.659
100		0.69	0.648	0.618	0.559

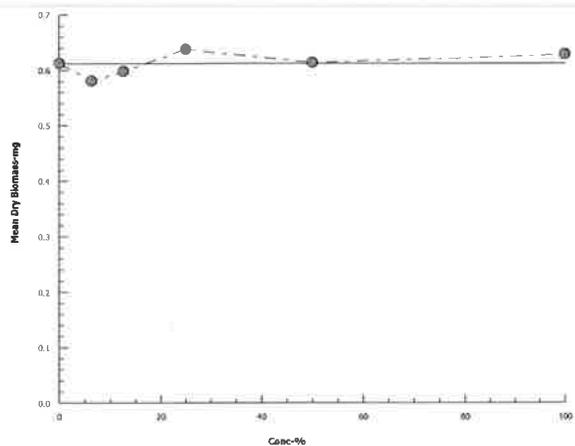
Fathead Minnow 7-d Larval Survival and Growth Test

New England Bioassay

Analysis ID: 15-6921-9121 Endpoint: Mean Dry Biomass-mg
Analyzed: 05 Aug-16 10:08 Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.9.2
Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 05 Aug-16 10:08 (p 1 of 4)
 Test Code: 16-942b | 02-3974-1214

Fathead Minnow 7-d Larval Survival and Growth Test

New England Bioassay

Analysis ID: 03-4568-7849	Endpoint: 7d Survival Rate	CETIS Version: CETISv1.9.2
Analyzed: 05 Aug-16 10:08	Analysis: Parametric-Control vs Treatments	Official Results: Yes
Batch ID: 14-5681-8167	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 18 Jul-16 15:07	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 25 Jul-16 13:53	Species: Pimephales promelas	Brine: Not Applicable
Duration: 6d 23h	Source: In-House Culture	Age: <24h
Sample ID: 19-1843-7281	Code: 725907A1	Client: Pine Brook Country Club
Sample Date: 18 Jul-16 09:00	Material: WWTF Effluent	Project:
Receipt Date: 18 Jul-16 12:07	Source: Pine Brook Country Club (MA0032212)	
Sample Age: 6h	Station:	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	C > T	100	> 100	n/a	1	14.06%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		6.25	1.558	2.407	0.226	6	CDF	0.2099	Non-Significant Effect
		12.5	0.4348	2.407	0.226	6	CDF	0.6755	Non-Significant Effect
		25	0.4348	2.407	0.226	6	CDF	0.6755	Non-Significant Effect
		50	1.627	2.407	0.226	6	CDF	0.1896	Non-Significant Effect
		100	1.248	2.407	0.226	6	CDF	0.3179	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	1	0.8	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0815923	0.0163185	5	0.9294	0.4851	Non-Significant Effect
Error	0.316036	0.0175576	18			
Total	0.397629		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Levene Equality of Variance Test	4.736	4.248	0.0062	Unequal Variances
Variances	Mod Levene Equality of Variance Test	2.802	4.248	0.0483	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9253	0.884	0.0767	Normal Distribution

7d Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
6.25		4	0.9000	0.6750	1.0000	0.9500	0.7000	1.0000	0.0707	15.71%	10.00%
12.5		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
25		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
50		4	0.9000	0.7163	1.0000	0.9000	0.8000	1.0000	0.0577	12.83%	10.00%
100		4	0.9250	0.7727	1.0000	0.9500	0.8000	1.0000	0.0479	10.35%	7.50%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.00%	0.00%
6.25		4	1.266	0.9499	1.582	1.331	0.9912	1.412	0.09936	15.70%	10.34%
12.5		4	1.371	1.242	1.501	1.412	1.249	1.412	0.04074	5.94%	2.89%
25		4	1.371	1.242	1.501	1.412	1.249	1.412	0.04074	5.94%	2.89%
50		4	1.26	0.9795	1.54	1.26	1.107	1.412	0.08801	13.97%	10.80%
100		4	1.295	1.061	1.529	1.331	1.107	1.412	0.07348	11.35%	8.28%

Fathead Minnow 7-d Larval Survival and Growth Test

New England Bioassay

Analysis ID: 03-4568-7849 Endpoint: 7d Survival Rate
 Analyzed: 05 Aug-16 10:08 Analysis: Parametric-Control vs Treatments

CETIS Version: CETISv1.9.2
 Official Results: Yes

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	0.7000	0.9000
12.5		1.0000	1.0000	1.0000	0.9000
25		1.0000	0.9000	1.0000	1.0000
50		0.8000	1.0000	0.8000	1.0000
100		1.0000	0.9000	1.0000	0.8000

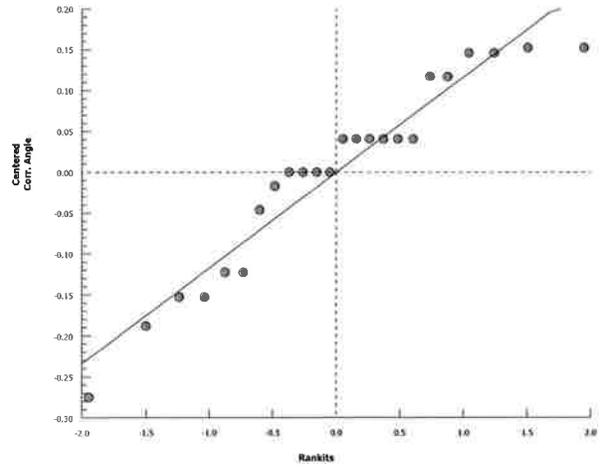
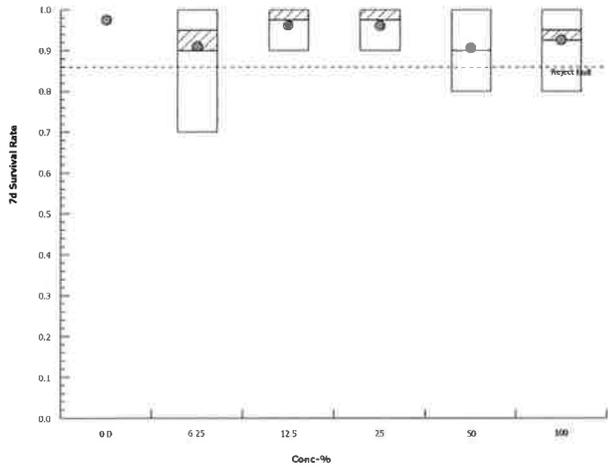
Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.412	1.412	1.412	1.412
6.25		1.412	1.412	0.9912	1.249
12.5		1.412	1.412	1.412	1.249
25		1.412	1.249	1.412	1.412
50		1.107	1.412	1.107	1.412
100		1.412	1.249	1.412	1.107

7d Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	10/10	10/10	10/10
6.25		10/10	10/10	7/10	9/10
12.5		10/10	10/10	10/10	9/10
25		10/10	9/10	10/10	10/10
50		8/10	10/10	8/10	10/10
100		10/10	9/10	10/10	8/10

Graphics



CETIS Analytical Report

Report Date: 05 Aug-16 10:08 (p 3 of 4)
 Test Code: 16-942b | 02-3974-1214

Fathead Minnow 7-d Larval Survival and Growth Test

New England Bioassay

Analysis ID: 18-6372-1481	Endpoint: Mean Dry Biomass-mg	CETIS Version: CETISv1.9.2
Analyzed: 05 Aug-16 10:08	Analysis: Parametric-Control vs Treatments	Official Results: Yes
Batch ID: 14-5681-8167	Test Type: Growth-Survival (7d)	Analyst:
Start Date: 18 Jul-16 15:07	Protocol: EPA/821/R-02-013 (2002)	Diluent: Laboratory Water
Ending Date: 25 Jul-16 13:53	Species: Pimephales promelas	Brine: Not Applicable
Duration: 6d 23h	Source: In-House Culture	Age: <24h
Sample ID: 19-1843-7281	Code: 725907A1	Client: Pine Brook Country Club
Sample Date: 18 Jul-16 09:00	Material: WWTF Effluent	Project:
Receipt Date: 18 Jul-16 12:07	Source: Pine Brook Country Club (MA0032212)	
Sample Age: 6h	Station:	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	100	> 100	n/a	1	11.86%

Dunnett Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		6.25	1.052	2.407	0.073	6	CDF	0.3993	Non-Significant Effect
		12.5	0.4803	2.407	0.073	6	CDF	0.6560	Non-Significant Effect
		25	-0.8032	2.407	0.073	6	CDF	0.9710	Non-Significant Effect
		50	-0.04135	2.407	0.073	6	CDF	0.8452	Non-Significant Effect
		100	-0.53	2.407	0.073	6	CDF	0.9436	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	0.6128	0.25	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0082399	0.001648	5	0.9042	0.4998	Non-Significant Effect
Error	0.0328078	0.0018227	18			
Total	0.0410477		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	3.236	15.09	0.6636	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9638	0.884	0.5191	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	0.6128	0.5516	0.6739	0.597	0.587	0.67	0.01923	6.28%	0.00%
6.25		4	0.581	0.5091	0.6529	0.6	0.514	0.61	0.02259	7.78%	5.18%
12.5		4	0.5982	0.5621	0.6344	0.597	0.572	0.627	0.01137	3.80%	2.37%
25		4	0.637	0.594	0.68	0.637	0.607	0.667	0.01351	4.24%	-3.96%
50		4	0.614	0.5249	0.7031	0.6195	0.553	0.664	0.02799	9.12%	-0.20%
100		4	0.6287	0.5411	0.7164	0.633	0.559	0.69	0.02754	8.76%	-2.61%

Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	0.597	0.597	0.587	0.67
6.25		0.606	0.61	0.514	0.594
12.5		0.627	0.572	0.593	0.601
25		0.667	0.651	0.607	0.623
50		0.553	0.664	0.58	0.659
100		0.69	0.648	0.618	0.559

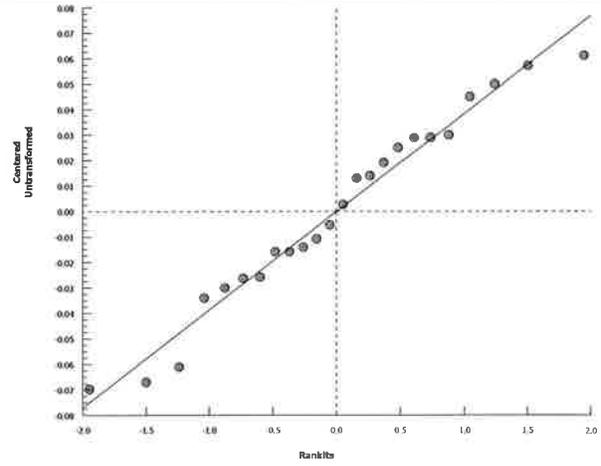
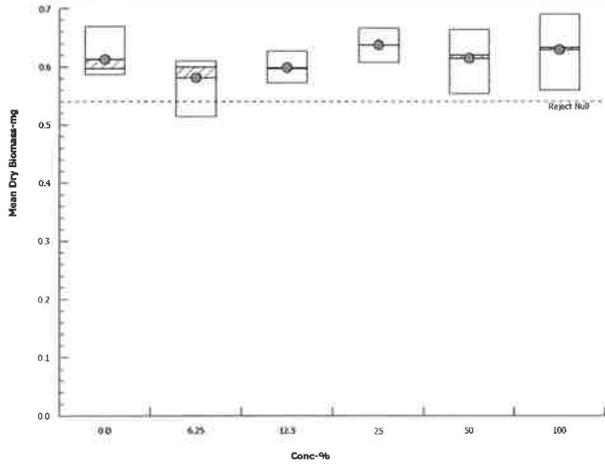
Fathead Minnow 7-d Larval Survival and Growth Test

New England Bioassay

Analysis ID: 18-6372-1481 Endpoint: Mean Dry Biomass-mg
Analyzed: 05 Aug-16 10:08 Analysis: Parametric-Control vs Treatments

CETIS Version: CETISv1.9.2
Official Results: Yes

Graphics



Concentration	Rep	Final Weight (mg)	Initial Weight (mg)	Total Weight (mg)	Average per fish (mg)	Mean fish weight (mg)	Standard Deviation
NEB Lab Synthetic Diluent	1	937.59	931.62	5.97	0.597	0.6128	0.038456686
	2	933.31	927.34	5.97	0.597		
	3	940.00	934.13	5.87	0.587		
	4	936.08	929.38	6.70	0.670		
Pine Brook Control	1	929.50	922.55	6.95	0.695	0.5675	0.245852937
	2	941.39	934.40	6.99	0.699		
	3	931.91	925.14	6.77	0.677		
	4	926.86	924.87	1.99	0.199		
6.25%	1	932.97	926.91	6.06	0.606	0.5810	0.045181117
	2	929.46	923.36	6.10	0.610		
	3	925.31	920.17	5.14	0.514		
	4	930.51	924.57	5.94	0.594		
12.5%	1	936.11	929.84	6.27	0.627	0.5982	0.022735801
	2	934.14	928.42	5.72	0.572		
	3	937.29	931.36	5.93	0.593		
	4	934.96	928.95	6.01	0.601		
25%	1	933.16	926.49	6.67	0.667	0.6370	0.027030847
	2	931.16	924.65	6.51	0.651		
	3	931.52	925.45	6.07	0.607		
	4	933.61	927.38	6.23	0.623		
50%	1	930.93	925.40	5.53	0.553	0.6140	0.05598214
	2	934.73	928.09	6.64	0.664		
	3	935.46	929.66	5.80	0.580		
	4	935.67	929.08	6.59	0.659		
100%	1	939.34	932.44	6.90	0.690	0.6287	0.055084027
	2	938.50	932.02	6.48	0.648		
	3	937.64	931.46	6.18	0.618		
	4	937.74	932.15	5.59	0.559		

NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS: Pine Brook Country Club, 42 Newton Street, Weston, MA 02193								
NEB PROJECT NUMBER: 05.0752101.00			TEST ORGANISM: <i>Pimephales promelas</i>					
DILUTION WATER SOURCE: Laboratory Synthetic Softwater			START DATE: 7/18/16			TIME: 1507		
ANALYST	MV	CB	MV	MV	CW	ER	ER	
NEB Lab Synthetic Diluent	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.0	25.4	24.8	25.5	25.1	25.1	24.8	
D.O. mg/L Initial	8.4	8.2	8.0	8.2	8.3	8.1	8.2	
pH s.u. Initial	7.5	7.4	7.3	7.5	7.5	7.4	7.5	
Conductivity µS Initial	175	175	176	175	175	177	176	
Temp °C Final	24.8	24.3	24.0	24.9	24.5	24.5	24.6	
D.O. mg/L Final	7.3	7.3	7.4	6.4	6.6	7.2	7.2	
pH s.u. Final	7.6	7.6	7.4	7.6	7.3	7.3	7.9	
Conductivity µS Final	193	203	209	217	222	199	221	
Pine Brook Control	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.3	24.7	24.5	25.4	25.8	24.9	24.3	
D.O. mg/L Initial	8.7	8.5	6.8	8.4	7.3	8.0	8.1	
pH s.u. Initial	7.0	6.9	6.9	7.1	7.0	6.9	7.1	
Conductivity µS Initial	709	703	724	719	713	714	711	
Temp °C Final	24.6	24.5	24.0	24.8	24.4	24.4	24.6	
D.O. mg/L Final	7.3	6.5	7.3	6.7	6.3	7.3	7.8	
pH s.u. Final	7.2	7.1	7.0	7.3	7.0	7.2	7.6	
Conductivity µS Final	726	730	760	767	764	741	766	
6.25%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	26.0	25.4	24.2	25.4	25.3	25.1	25.0	
D.O. mg/L Initial	7.6	8.2	7.9	8.3	7.6	8.1	8.4	
pH s.u. Initial	7.3	7.3	7.2	7.4	7.3	7.4	7.5	
Conductivity µS Initial	229	234	231	234	236	230	226	
Temp °C Final	24.7	24.8	24.0	24.9	24.7	24.8	24.4	
D.O. mg/L Final	7.3	6.0	7.0	6.6	6.9	7.1	6.9	
pH s.u. Final	7.5	7.3	7.3	7.5	7.4	7.4	7.8	
Conductivity µS Final	249	263	275	273	273	252	271	
12.5%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.6	25.6	24.9	25.4	25.3	25.2	25.2	
D.O. mg/L Initial	8.0	8.2	7.8	8.2	8.0	8.1	8.5	
pH s.u. Initial	7.5	7.5	7.2	7.4	7.4	7.6	7.8	
Conductivity µS Initial	289	293	282	289	289	289	287	
Temp °C Final	24.7	24.6	24.0	25.0	24.8	24.8	24.5	
D.O. mg/L Final	7.2	6.4	6.4	6.8	6.6	7.1	6.8	
pH s.u. Final	7.6	7.2	7.3	7.5	7.4	7.5	7.7	
Conductivity µS Final	312	316	345	326	330	313	335	

NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS: <u>Pine Brook Country Club, 42 Newton Street, Weston, MA 02193</u>									
NEB PROJECT NUMBER:		<u>05.0752101.00</u>			TEST ORGANISM		<u><i>Pimephales promelas</i></u>		
DILUTION WATER SOURCE:		<u>Laboratory Synthetic Softwater</u>			START DATE:		<u>7/18/16</u>	TIME: <u>1507</u>	
	25%	1	2	3	4	5	6	7	Remarks
Temp °C	Initial	25.6	25.7	24.9	25.3	25.1	25.1	25.2	
D.O. mg/L	Initial	8.0	8.1	7.3	8.3	7.8	8.1	8.4	
pH s.u.	Initial	7.5	7.7	7.3	7.4	7.5	7.7	8.0	
Conductivity µS	Initial	405	407	404	396	400	392	392	
Temp °C	Final	24.8	24.5	24.0	25.0	24.7	24.7	24.5	
D.O. mg/L	Final	7.5	6.4	6.0	6.7	6.8	7.1	6.9	
pH s.u.	Final	7.8	7.4	7.3	7.5	7.5	7.6	7.6	
Conductivity µS	Final	422	433	439	438	448	415	436	
	50%	1	2	3	4	5	6	7	Remarks
Temp °C	Initial	25.8	26.0	24.8	25.4	25.1	25.1	25.6	
D.O. mg/L	Initial	7.4	8.1	6.7	8.0	7.3	7.9	8.4	
pH s.u.	Initial	7.6	7.7	7.4	7.5	7.6	7.9	8.1	
Conductivity µS	Initial	629	629	621	620	614	613	618	
Temp °C	Final	24.8	24.5	24.0	24.9	24.8	24.7	24.6	
D.O. mg/L	Final	7.2	6.2	6.3	6.7	6.5	7.0	6.9	
pH s.u.	Final	8.0	7.6	7.4	7.7	7.7	7.8	7.8	
Conductivity µS	Final	646	655	660	664	660	634	663	
	100%	1	2	3	4	5	6	7	Remarks
Temp °C	Initial	26.0	26.0	24.7	25.4	25.1	25.1	26.3	
D.O. mg/L	Initial	4.5	7.9	7.6	7.7	5.8	7.6	8.5	
pH s.u.	Initial	7.6	7.7	7.6	7.6	4.2	8.0	8.2	
Conductivity µS	Initial	1,075	1,075	1,061	1,050	1,043	1,046	1,046	
Temp °C	Final	24.5	24.5	24.0	24.9	24.3	24.6	24.5	
D.O. mg/L	Final	7.2	6.6	6.4	6.9	6.4	7.3	7.0	
pH s.u.	Final	8.2	8.0	7.8	7.9	8.0	8.1	8.1	
Conductivity µS	Final	1,092	1,105	1,111	1,093	1,095	1,069	1,100	
		1	2	3	4	5	6	7	Remarks
Temp °C	Initial								
D.O. mg/L	Initial								
pH s.u.	Initial								
Conductivity µS	Initial								
Temp °C	Final								
D.O. mg/L	Final								
pH s.u.	Final								
Conductivity µS	Final								

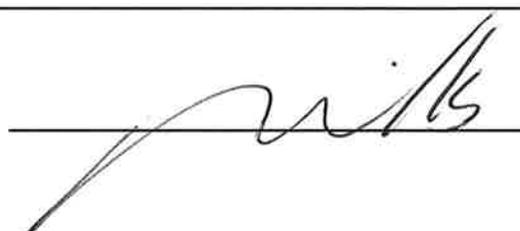
**NEW ENGLAND BIOASSAY
INITIAL CHEMISTRY DATA**

CLIENT: Pine Brook Country Club
 NEB JOB # 05.0752101.00
 TEST ID # C.dubia P.promelas

DATE RECEIVED	7/18/16		7/20/16		7/22/16	
SAMPLE TYPE:	EFF #1	BROOK #1	EFF #2	BROOK #2	EFF #3	BROOK #3
COC #	C36-2534	C36-2535	C36-2583	C36-2584	C36-2612	C36-2613
pH (SU)	7.5	7.1	7.5	7.1	7.1	7.0
Temperature (°C)	2.5	1.9	3.1	4.2	2.9,2.8	5.2
Dissolved Oxygen (mg/L)	5.7	7.5	6.7	6.9	5.2	7.5
Conductivity (µmhos)	1,089	705	1,054	719	1,040	711
Salinity (ppt)	<1	<1	<1	<1	<1	<1
TRC - DPD (mg/L)	0.005	0.007	0.007	0.007	0.016	0.015
TRC - Amperometric (mg/L)	N/A	N/A	N/A	N/A	N/A	N/A
Hardness (mg/L as CaCO ₃)	162	156	144	152	120	158
Alkalinity (mg/l as CaCO ₃)	220	60	180	60	180	65
Tech Initials	CB	CB	ER	ER	MV	MV

NOTE: NA = NOT APPLICABLE

Data Reviewed By: _____



Date Reviewed: _____





Friday, July 22, 2016

Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Project ID: PINE BROOK COUNTRY CLUB
Sample ID#s: BN74925 - BN74927

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

A handwritten signature in black ink that reads "Phyllis Shiller". The signature is written in a cursive style with a large initial "P".

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301



Environmental Laboratories, Inc.
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
 Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report
 July 22, 2016

FOR: Attn: Ms. Kim Wills
 New England Bioassay
 a Division of GZA GeoEnvironmental
 77 Batson Drive
 Manchester, CT 06040

Sample Information

Matrix: WASTE WATER
 Location Code: NEB
 Rush Request: Standard
 P.O.#: 21774

Custody Information

Collected by:
 Received by: LB
 Analyzed by: see "By" below

Date

07/18/16
 07/18/16

Time

16:00

Laboratory Data

SDG ID: GBN74925
 Phoenix ID: BN74925

Project ID: PINE BROOK COUNTRY CLUB
 Client ID: EFFLUENT 1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.241	0.010	mg/L	1	07/19/16	LK	E200.7
Cadmium	0.0001	0.0001	mg/L	1	07/20/16	RS	SM3113B
Copper	0.022	0.002	mg/L	1	07/19/16	LK	E200.7
Hardness (CaCO3)	165	0.1	mg/L	1	07/19/16		E200.7
Nickel	0.006	0.001	mg/L	1	07/19/16	LK	E200.7
Lead	< 0.0003	0.0003	mg/L	1	07/20/16	RS	SM3113B
Zinc	0.018	0.002	mg/L	1	07/19/16	LK	E200.7
Alkalinity-CaCO3	242	5.00	mg/L	1	07/19/16	RR/EG	SM2320B-97
Conductivity	1020	5.00	umhos/cm	1	07/19/16	RR/EG	SM2510B-97
Ammonia as Nitrogen	0.30	0.05	mg/L	1	07/20/16	WHM	E350.1
Tot. Diss. Solids	630	10	mg/L	1	07/19/16	AS/KH	SM2540C-97
Tot. Org. Carbon	4.6	0.50	mg/L	1	07/19/16	RWR	SM5310C/E415.1-00
Total Solids	650	10	mg/L	1	07/19/16	AS/KH	SM2540B-97
Total Metals Digestion	Completed				07/18/16	AG	

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
 This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director

July 22, 2016

Reviewed and Released by: Deb Lawrie, Project Manager



Environmental Laboratories, Inc.
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
 Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report
 July 22, 2016

FOR: Attn: Ms. Kim Wills
 New England Bioassay
 a Division of GZA GeoEnvironmental
 77 Batson Drive
 Manchester, CT 06040

Sample Information

Matrix: WASTE WATER
 Location Code: NEB
 Rush Request: Standard
 P.O.#: 21774

Custody Information

Collected by:
 Received by: LB
 Analyzed by: see "By" below

Date Time
 07/18/16
 07/18/16 16:00

Laboratory Data

SDG ID: GBN74925
 Phoenix ID: BN74926

Project ID: PINE BROOK COUNTRY CLUB
 Client ID: RECEIVING WATER 1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.072	0.010	mg/L	1	07/19/16	LK	E200.7
Cadmium	< 0.0001	0.0001	mg/L	1	07/20/16	RS	SM3113B
Copper	< 0.002	0.002	mg/L	1	07/19/16	LK	E200.7
Hardness (CaCO3)	152	0.1	mg/L	1	07/19/16		E200.7
Nickel	0.001	0.001	mg/L	1	07/19/16	LK	E200.7
Lead	< 0.0003	0.0003	mg/L	1	07/20/16	RS	SM3113B
Zinc	0.018	0.002	mg/L	1	07/19/16	LK	E200.7
Alkalinity-CaCO3	70.8	5.00	mg/L	1	07/19/16	RR/EG	SM2320B-97
Conductivity	676	5.00	umhos/cm	1	07/19/16	RR/EG	SM2510B-97
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	07/20/16	WHM	E350.1
pH	7.09	0.10	pH Units	1	07/19/16 06:45	RR/EG	SM4500-H B-00
Tot. Org. Carbon	2.4	0.50	mg/L	1	07/20/16	RR/EG	SM5310C/E415.1-00
Total Metals Digestion	Completed				07/18/16	AG	

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
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Phyllis Shiller, Laboratory Director

July 22, 2016

Reviewed and Released by: Deb Lawrie, Project Manager



Environmental Laboratories, Inc.
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
 Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report
 July 22, 2016

FOR: Attn: Ms. Kim Wills
 New England Bioassay
 a Division of GZA GeoEnvironmental
 77 Batson Drive
 Manchester, CT 06040

Sample Information

Matrix: WASTE WATER
 Location Code: NEB
 Rush Request: Standard
 P.O.#: 21774

Custody Information

Collected by:
 Received by: LB
 Analyzed by: see "By" below

Date Time

07/18/16
 07/18/16 16:00

Laboratory Data

SDG ID: GBN74925
 Phoenix ID: BN74927

Project ID: PINE BROOK COUNTRY CLUB
 Client ID: EFFLUENT GRAB

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Chlorine Residual	< 0.02	0.02	mg/L	1	07/18/16 17:45	O	SM4500CLG-97
pH	8.04	0.10	pH Units	1	07/19/16 06:48	RR/EG	SM4500-H B-00

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The regulatory hold time for Chlorine is immediately. This Chlorine was performed in the laboratory and may be considered outside of hold-time.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
 This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director
 July 22, 2016

Reviewed and Released by: Deb Lawrie, Project Manager



Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
 Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

July 22, 2016

QA/QC Data

SDG I.D.: GBN74925

Parameter	Blk Blank	RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 352565 (mg/L), QC Sample No: BN73721 (BN74925, BN74926)													
Cadmium - Water	BRL	0.0001	<0.0001	<0.0001	NC	108			105			75 - 125	20
QA/QC Batch 352595 (mg/L), QC Sample No: BN74618 (BN74925, BN74926)													
<u>ICP Metals - Aqueous</u>													
Aluminum	BRL	0.010	0.155	0.155	0	91.4			90.8			75 - 125	20
Copper	BRL	0.005	0.011	0.010	NC	99.4			98.2			75 - 125	20
Nickel	BRL	0.001	0.002	0.001	NC	106			104			75 - 125	20
Zinc	BRL	0.002	0.006	0.005	NC	100			100			75 - 125	20
QA/QC Batch 352704 (mg/L), QC Sample No: BN74922 (BN74925, BN74926)													
Lead (Furnace) - Water	BRL	0.001	<0.0003	<0.001	NC	104			104			75 - 125	30



Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045

Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

July 22, 2016

QA/QC Data

SDG I.D.: GBN74925

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 352592 (mg/L), QC Sample No: BN74614 (BN74927)													
Chlorine Residual	BRL	0.02	<0.02	<0.02	NC	107							
QA/QC Batch 352668 (mg/L), QC Sample No: BN74619 (BN74925, BN74926)													
Alkalinity-CaCO3	BRL	5.00	45	46	NC	107						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 352678 (umhos/cm), QC Sample No: BN74619 (BN74925, BN74926)													
Conductivity	BRL	5.00	170	173	1.70	97.5						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 352663 (pH), QC Sample No: BN74619 (BN74926, BN74927)													
pH			7.42	7.46	0.50	98.5						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 352644 (mg/L), QC Sample No: BN74715 (BN74925)													
Tot. Diss. Solids	BRL	10	96	120	22.2	89.0						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 352643 (mg/L), QC Sample No: BN74922 (BN74925)													
Total Solids	BRL	10	490	470	4.20	100						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 352737 (mg/L), QC Sample No: BN74925 (BN74925)													
Tot. Org. Carbon	BRL	0.5		4.6		107			101			85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 352724 (mg/L), QC Sample No: BN75010 (BN74925, BN74926)													
Ammonia as Nitrogen	BRL	0.05	92.0	91.0	1.10	98.0			92.5			85 - 115	20
QA/QC Batch 352965 (mg/L), QC Sample No: BN76924 (BN74926)													
Total Organic Carbon	BRL	1.0	<1.0	<1.0	NC	100			96.0			85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													

r = This parameter is outside laboratory RPD specified recovery limits.

QA/QC Data

SDG I.D.: GBN74925

Parameter	Blk Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
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If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference

LCS - Laboratory Control Sample

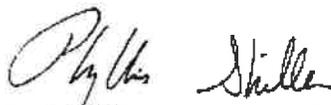
LCSD - Laboratory Control Sample Duplicate

MS - Matrix Spike

MS Dup - Matrix Spike Duplicate

NC - No Criteria

Intf - Interference



Phyllis Shiller, Laboratory Director

July 22, 2016

Sample Criteria Exceedences Report

GBN74925 - NEB

Criteria: None

State: MA

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL	Criteria	Analysis Units
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*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Comments

July 22, 2016

SDG I.D.: GBN74925

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.



Monday, July 25, 2016

Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Project ID: PINE BROOK COUNTRY CLUB
Sample ID#s: BN76648 - BN76650

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

A handwritten signature in black ink that reads "Phyllis Shiller". The signature is written in a cursive style.

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301



Environmental Laboratories, Inc.
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
 Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report
 July 25, 2016

FOR: Attn: Ms. Kim Wills
 New England Bioassay
 a Division of GZA GeoEnvironmental
 77 Batson Drive
 Manchester, CT 06040

Sample Information

Matrix: WASTE WATER
 Location Code: NEB
 Rush Request: Standard
 P.O.#: 21774

Custody Information

Collected by:
 Received by: LB
 Analyzed by: see "By" below

Date Time
 07/20/16 9:00
 07/20/16 15:38

Laboratory Data

SDG ID: GBN76648
 Phoenix ID: BN76648

Project ID: PINE BROOK COUNTRY CLUB
 Client ID: EFFLUENT 2 C36-2583

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	0.19	0.05	mg/L	1	07/22/16	WHM	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
 This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director
 July 25, 2016

Reviewed and Released by: Bobbi Aloisa, Vice President



Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

July 25, 2016

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information

Matrix: WASTE WATER
Location Code: NEB
Rush Request: Standard
P.O.#: 21774

Custody Information

Collected by:
Received by: LB
Analyzed by: see "By" below

Date Time

07/20/16 9:30
07/20/16 15:38

Laboratory Data

SDG ID: GBN76648
Phoenix ID: BN76649

Project ID: PINE BROOK COUNTRY CLUB
Client ID: RECEIVING WATER 2 C36-2584

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	07/22/16	WHM	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

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Phyllis Shiller, Laboratory Director

July 25, 2016

Reviewed and Released by: Bobbi Aloisa, Vice President



Environmental Laboratories, Inc.
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
 Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report
 July 25, 2016

FOR: Attn: Ms. Kim Wills
 New England Bioassay
 a Division of GZA GeoEnvironmental
 77 Batson Drive
 Manchester, CT 06040

Sample Information

Matrix: WASTE WATER
 Location Code: NEB
 Rush Request: Standard
 P.O.#: 21774

Custody Information

Collected by:
 Received by: LB
 Analyzed by: see "By" below

Date Time

07/20/16 9:15
 07/20/16 15:38

Laboratory Data

SDG ID: GBN76648
 Phoenix ID: BN76650

Project ID: PINE BROOK COUNTRY CLUB
 Client ID: EFFLUENT GRAB 2

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Chlorine Residual	< 0.02	0.02	mg/L	1	07/20/16 16:30	O	SM4500CLG-97
pH	8.08	0.10	pH Units	1	07/21/16 10:21	RR/EG	SM4500-H B-00

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The regulatory hold time for Chlorine is immediately. This Chlorine was performed in the laboratory and may be considered outside of hold-time.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
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Phyllis Shiller, Laboratory Director

July 25, 2016

Reviewed and Released by: Bobbi Aloisa, Vice President



Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

July 25, 2016

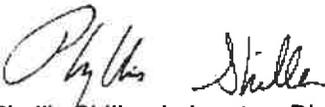
QA/QC Data

SDG I.D.: GBN76648

Parameter	Blk Blank	Sample RL	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 352866 (mg/L), QC Sample No: BN76308 (BN76650)												
Chlorine Residual	BRL	0.02	<0.02	<0.02	NC	95.0						
QA/QC Batch 353018 (pH), QC Sample No: BN76341 (BN76650)												
pH			7.24			98.6					85 - 115	20
Comment: Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.												
QA/QC Batch 353070 (mg/L), QC Sample No: BN76527 (BN76648, BN76649)												
Ammonia as Nitrogen	BRL	0.05	9.57	9.52	0.50	94.0		98.2			85 - 115	20

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

- RPD - Relative Percent Difference
- LCS - Laboratory Control Sample
- LCSD - Laboratory Control Sample Duplicate
- MS - Matrix Spike
- MS Dup - Matrix Spike Duplicate
- NC - No Criteria
- Intf - Interference


Phyllis Shiller, Laboratory Director
July 25, 2016

Monday, July 25, 2016

Criteria: None

State: MA

Sample Criteria Exceedences Report

GBN76648 - NEB

Page 1 of 1

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL	Analysis
								Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.



Environmental Laboratories, Inc.

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Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Comments

July 25, 2016

SDG I.D.: GBN76648

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.



Thursday, July 28, 2016

Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Project ID: PINE BROOK COUNTRY CLUB
Sample ID#s: BN79106 - BN79108

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

A handwritten signature in cursive script that reads "Phyllis Shiller".

Phyllis Shiller

Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301



Environmental Laboratories, Inc.
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
 Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report
 July 28, 2016

FOR: Attn: Ms. Kim Wills
 New England Bioassay
 a Division of GZA GeoEnvironmental
 77 Batson Drive
 Manchester, CT 06040

Sample Information

Matrix: WASTE WATER
 Location Code: NEB
 Rush Request: Standard
 P.O.#: 21774

Custody Information

Collected by:
 Received by: SW
 Analyzed by: see "By" below

Date Time

07/22/16 9:30
 07/22/16 16:25

Laboratory Data

SDG ID: GBN79106
 Phoenix ID: BN79106

Project ID: PINE BROOK COUNTRY CLUB
 Client ID: C36-2612 EFFLUENT-3

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	0.10	0.05	mg/L	1	07/27/16	WHM	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
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Phyllis Shiller, Laboratory Director

July 28, 2016

Reviewed and Released by: Kathleen Cressia, QA/QC Officer



Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

July 28, 2016

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information

Matrix: WASTE WATER
Location Code: NEB
Rush Request: Standard
P.O.#: 21774

Custody Information

Collected by:
Received by: SW
Analyzed by: see "By" below

Date Time

07/22/16
07/22/16 16:25

Laboratory Data

SDG ID: GBN79106
Phoenix ID: BN79107

Project ID: PINE BROOK COUNTRY CLUB
Client ID: C36-2613 RECEIVING WATER-3

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	07/27/16	WHM	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
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Phyllis Shiller, Laboratory Director

July 28, 2016

Reviewed and Released by: Kathleen Cressia, QA/QC Officer



Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report
July 28, 2016

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information

Matrix: WASTE WATER
Location Code: NEB
Rush Request: Standard
P.O.#: 21774

Custody Information

Collected by:
Received by: SW
Analyzed by: see "By" below

Date Time

07/22/16 9:15
07/22/16 16:25

Laboratory Data

SDG ID: GBN79106
Phoenix ID: BN79108

Project ID: PINE BROOK COUNTRY CLUB
Client ID: EFFLUENT GRAB-3

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Chlorine Residual	< 0.02	0.02	mg/L	1	07/22/16 19:20	O	SM4500CLG-97
pH	8.09	0.10	pH Units	1	07/23/16 03:32	RWR/KDB	SM4500-H B-00

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The regulatory hold time for Chlorine is immediately. This Chlorine was performed in the laboratory and may be considered outside of hold-time.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director

July 28, 2016

Reviewed and Released by: Kathleen Cressia, QA/QC Officer



Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

July 28, 2016

QA/QC Data

SDG I.D.: GBN79106

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 353499 (mg/L), QC Sample No: BN78397 (BN79106, BN79107)													
Ammonia as Nitrogen	BRL	0.05	<0.05	<0.05	NC	97.1			90.0			85 - 115	20
QA/QC Batch 353289 (pH), QC Sample No: BN78406 (BN79108)													
pH			7.68	7.70	0.30	98.6						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 353268 (mg/L), QC Sample No: BN78564 (BN79108)													
Chlorine Residual	BRL	0.02	<0.02	<0.02	NC	104							

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

- RPD - Relative Percent Difference
- LCS - Laboratory Control Sample
- LCSD - Laboratory Control Sample Duplicate
- MS - Matrix Spike
- MS Dup - Matrix Spike Duplicate
- NC - No Criteria
- Intf - Interference


 Phyllis Shiller, Laboratory Director
 July 28, 2016

Sample Criteria Exceedences Report

Criteria: None

State: MA

GBN79106 - NEB

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL	Analysis Units
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*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.



Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Comments

July 28, 2016

SDG I.D.: GBN79106

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

NEW ENGLAND BIOASSAY- CHAIN-OF-CUSTODY

EFFLUENT

Sample Set #1

Sampler: Nathan Iriana
Title: Operator
Facility: Pine Brook Country Club

RECEIVING WATER

Sampler: Nathan Iriana
Title: Operator
Facility: Pine Brook Country Club

Sampling Method: X Composite

Sample ID: Effluent
Start Date: 07-17-16 Time: 0900
End Date: 07-18-16 Time: 0900

Sampling Method: X Grab

Sample ID: Pine Brook
Date Collected: 07-18-16
Time Collected: 0930

Sampling Method: X Grab (for pH and TRC only X)

Date Collected: 07-18-16
Time Collected: 0915

Sample Type: Prechlorinated
Dechlorinated
Unchlorinated
Chlorinated

Effluent Sampling Location and Procedures: Effluent discharge of P.O.T.W.
24 hr composite

Receiving Water Sampling Location and Procedures: Pine Brook C.C. on site
brook. grab sample

Requested Analysis: X Chronic and modified acute

Sample Shipment

Method of Shipment: NEB Courier
Relinquished By: [Signature] Date: 07-18-16 Time: 0951
Received By: [Signature] Date: 07-18-16 Time: 0951
Relinquished By: [Signature] Date: 07-18-16 Time: 1207
Received By: [Signature] Date: 7/18/16 Time: 1207

Optional Information

Purchase Order # to reference on invoice: pine brook

FOR NEB USE ONLY

* Please return all ice packs NEB has provided to insure accurate temperature upon receipt to the NEB laboratory.

Temperature of Effluent Upon Receipt at Lab: 2.5 °C
Temperature of Receiving Water Upon Receipt at Lab: 1.9 °C
Effluent COC# C36-2534
Receiving Water COC# C36-2535

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
KIM WILLS, NEW ENGLAND BIOASSAY, 77 BATSON DRIVE, MANCHESTER CT 06042

NEW ENGLAND BIOASSAY- CHAIN-OF-CUSTODY

Sample Set # 2

EFFLUENT

Sampler: Nathan Iriana
Title: Operator
Facility: Pine Brook Country Club

RECEIVING WATER

Sampler: Nathan Iriana
Title: Operator
Facility: Pine Brook Country Club

Sampling Method: Composite

Sample ID: Effluent
Start Date: 07-19-16 Time: 0900
End Date: 07-20-16 Time: 0900

Sampling Method: Grab

Sample ID: Pine Brook
Date Collected: 0920
Time Collected: _____

Sampling Method: Grab (for pH and TRC only)

Date Collected: 07-20-16
Time Collected: 0915

Sample Type:
 Prechlorinated
 Dechlorinated
 Unchlorinated
 Chlorinated

Effluent Sampling Location and Procedures: Effluent discharge of p.o.t.w
24 hr composite

Receiving Water Sampling Location and Procedures: Pine Brook C.C. on
site brook, grab sample

Requested Analysis: Chronic and modified acute

Sample Shipment

Method of Shipment: NEB Courier

Relinquished By: <u>[Signature]</u>	Date: <u>07-20-16</u>	Time: <u>0951</u>
Received By: <u>[Signature]</u>	Date: <u>07-20-16</u>	Time: <u>0951</u>
Relinquished By: <u>[Signature]</u>	Date: <u>07-20-16</u>	Time: <u>1240</u>
Received By: <u>[Signature]</u>	Date: <u>7-20-16</u>	Time: <u>1245</u>

Optional Information

Purchase Order # to reference on invoice: pine brook

FOR NEB USE ONLY

* Please return all ice packs NEB has provided to insure accurate temperature upon receipt to the NEB laboratory.

Temperature of Effluent Upon Receipt at Lab: 4.2 °C
Effluent COC# C36-2583
Temperature of Receiving Water Upon Receipt at Lab: 4.1 °C
Receiving Water COC# C36-2584

**IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
KIM WILLS, NEW ENGLAND BIOASSAY, 77 BATSON DRIVE, MANCHESTER CT 06042**

NEW ENGLAND BIOASSAY - CHAIN-OF-CUSTODY

EFFLUENT

Sampler: Nathan Iriara
Title: Operator
Facility: Pine Brook Country Club

RECEIVING WATER

Sampler: Nathan Iriara
Title: Operator
Facility: Pine Brook Country Club

Sample Set #3

Sampling Method: Composite

Sample ID: Effluent
Start Date: 07-21-16 Time: 0930
End Date: 07-22-16 Time: 0930

Sampling Method: Grab

Sample ID: Pine Brook
Date Collected: 07-22-16
Time Collected: 0900

Sampling Method: Grab (for pH and TRC only)

Date Collected: 07-22-16
Time Collected: 0915

Sample Type: Prechlorinated
 Dechlorinated
 Unchlorinated
 Chlorinated

Effluent Sampling Location and Procedures: Effluent discharge of P.O.T.W.
24 hr Composite

Receiving Water Sampling Location and Procedures: Pine brook C.C. ON
Site brook. Grab 1 sample.

Requested Analysis: Chronic and modified acute

Sample Shipment

Method of Shipment: NEB Courier
Relinquished By: [Signature] Date: 07-22-16 Time: 1054
Received By: Chris Rauch Date: 07-22-16 Time: 10:54
Relinquished By: Chris Rauch Date: 07-22-16 Time: 12:55
Received By: [Signature] Date: 7-22-16 Time: 1300

Optional Information

Purchase Order # to reference on invoice: _____

FOR NEB USE ONLY

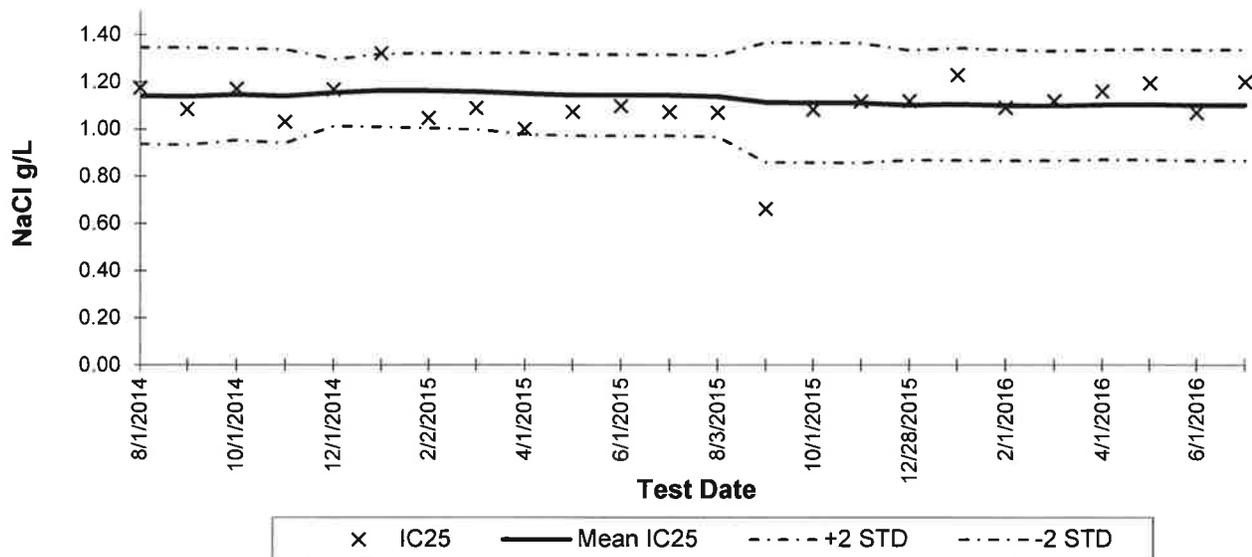
* Please return all ice packs NEB has provided to insure accurate temperature upon receipt to the NEB laboratory.

Temperature of Effluent Upon Receipt at Lab: 29.2-8
Effluent COC# C36-2012
Temperature of Receiving Water Upon Receipt at Lab: 5.2e
Receiving Water COC# C36-2013

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
KIM WILLS, NEW ENGLAND BIOASSAY, 77 BATSON DRIVE, MANCHESTER CT 06042

**New England Bioassay
Reference Toxicant Data: *Ceriodaphia dubia* Chronic Reproduction IC25**

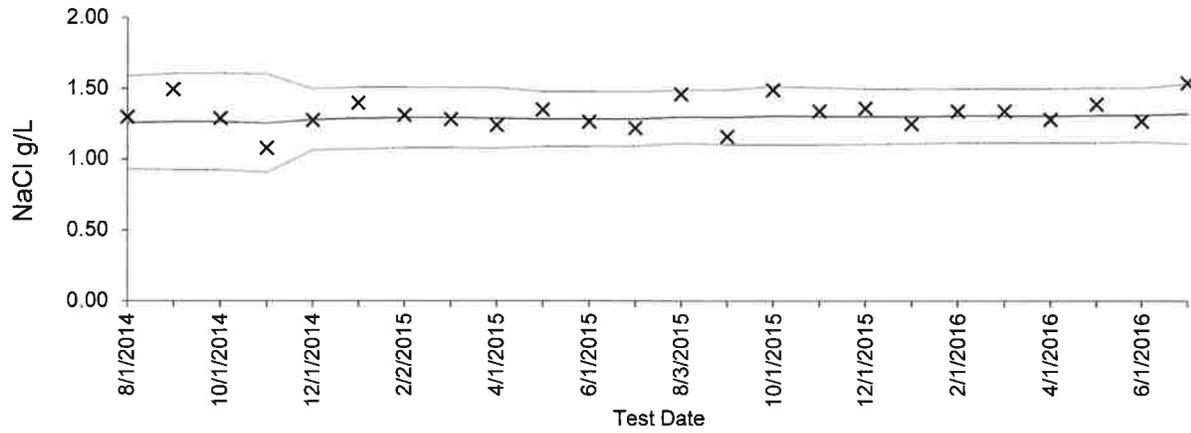
**Reference Toxicant: Sodium chloride
Test Dates: Aug 2014 - July 2016**



Test ID	Date	IC ₂₅	Mean IC ₂₅	STD	-2STD	+2STD	CV	CV National	CV National
								75th%	90th%
14-1202	8/1/2014	1.18	1.14	0.10	0.94	1.35	0.09	0.45	0.62
14-1426	9/2/2014	1.08	1.14	0.10	0.93	1.35	0.09	0.45	0.62
14-1629	10/1/2014	1.17	1.15	0.10	0.95	1.34	0.08	0.45	0.62
14-1886	11/3/2014	1.03	1.14	0.10	0.94	1.34	0.09	0.45	0.62
14-1982	12/1/2014	1.17	1.15	0.07	1.01	1.30	0.06	0.45	0.62
15-79	1/5/2015	1.32	1.16	0.08	1.01	1.32	0.07	0.45	0.62
15-148	2/2/2015	1.05	1.16	0.08	1.00	1.32	0.07	0.45	0.62
15-378	3/23/2015	1.09	1.16	0.08	1.00	1.32	0.07	0.45	0.62
15-460	4/1/2015	1.00	1.15	0.09	0.98	1.32	0.08	0.45	0.62
15-602	5/1/2015	1.07	1.14	0.09	0.97	1.32	0.08	0.45	0.62
15-750	6/1/2015	1.10	1.14	0.09	0.97	1.32	0.08	0.45	0.62
15-955	7/1/2015	1.07	1.14	0.09	0.97	1.32	0.07	0.45	0.62
15-1211	8/3/2015	1.07	1.14	0.09	0.97	1.31	0.08	0.45	0.62
15-1375	9/9/2015	0.66	1.11	0.13	0.86	1.37	0.11	0.45	0.62
15-1540	10/1/2015	1.08	1.11	0.13	0.86	1.37	0.11	0.45	0.62
15-1691	11/2/2015	1.12	1.11	0.13	0.86	1.36	0.11	0.45	0.62
15-1897	12/28/2015	1.12	1.10	0.12	0.87	1.33	0.11	0.45	0.62
16-37	1/4/2016	1.23	1.11	0.12	0.87	1.34	0.11	0.45	0.62
16-138	2/1/2016	1.09	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-307	3/1/2016	1.12	1.10	0.12	0.87	1.33	0.11	0.45	0.62
16-463	4/1/2016	1.16	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-596	5/2/2016	1.19	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-707	6/1/2016	1.07	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-880	7/1/2016	1.20	1.10	0.12	0.87	1.34	0.11	0.45	0.62

New England Bioassay
Reference Toxicant Data: *Pimephales promelas* 7-day Chronic Growth IC25

Reference Toxicant: Sodium chloride
Test Dates: Aug 2014 - July 2016



Test ID	Date	IC ₂₅	Mean IC ₂₅	STD	-2STD	+2STD	CV	CV National	
								75th	90th
14-1231	8/1/2014	1.30	1.26	0.16	0.93	1.59	0.13	0.38	0.45
14-1427	9/2/2014	1.49	1.27	0.17	0.92	1.61	0.13	0.38	0.45
14-1630	10/1/2014	1.29	1.27	0.17	0.93	1.61	0.13	0.38	0.45
14-1887	11/3/2014	1.08	1.25	0.17	0.91	1.60	0.14	0.38	0.45
14-2051	12/1/2014	1.28	1.28	0.11	1.07	1.50	0.08	0.38	0.45
15-80	1/5/2015	1.39	1.29	0.11	1.07	1.51	0.08	0.38	0.45
15-149	2/2/2015	1.31	1.30	0.11	1.08	1.51	0.08	0.38	0.45
15-255	3/2/2015	1.28	1.29	0.11	1.08	1.51	0.08	0.38	0.45
15-461	4/1/2015	1.24	1.29	0.11	1.08	1.50	0.08	0.38	0.45
15-604	5/1/2015	1.35	1.28	0.10	1.09	1.48	0.08	0.38	0.45
15-803	6/1/2015	1.27	1.28	0.10	1.09	1.48	0.08	0.38	0.45
15-956	7/1/2015	1.22	1.28	0.10	1.09	1.48	0.07	0.38	0.45
15-1212	8/3/2015	1.46	1.30	0.09	1.11	1.49	0.07	0.38	0.45
15-1376	9/9/2015	1.16	1.29	0.10	1.10	1.49	0.08	0.38	0.45
15-1541	10/1/2015	1.49	1.31	0.10	1.10	1.51	0.08	0.38	0.45
15-1742	11/2/2015	1.34	1.30	0.10	1.10	1.50	0.08	0.38	0.45
15-1881	12/1/2015	1.36	1.30	0.10	1.10	1.50	0.08	0.38	0.45
16-36	1/4/2016	1.25	1.30	0.10	1.11	1.49	0.07	0.38	0.45
16-139	2/1/2016	1.34	1.31	0.10	1.12	1.50	0.07	0.38	0.45
16-308	3/1/2016	1.34	1.31	0.10	1.12	1.50	0.07	0.38	0.45
16-464	4/1/2016	1.28	1.31	0.10	1.12	1.50	0.07	0.38	0.45
16-597	5/2/2016	1.39	1.31	0.10	1.12	1.50	0.07	0.38	0.45
16-708	6/1/2016	1.27	1.31	0.10	1.12	1.50	0.07	0.38	0.45
16-881	7/1/2016	1.54	1.32	0.11	1.11	1.53	0.08	0.38	0.45